Rarebook
QK99
.U6
B47
1820
v.3

AMERICAN

# MEDICAL BOTANY,

BEING A COLLECTION

OF THE

# NATIVE MEDICINAL PLANTS

OF THE

# UNITED STATES,

CONTAINING THEIR

## BOTANICAL HISTORY AND CHEMICAL ANALYSIS,

AND PROPERTIES AND USES

IN

## MEDICINE, DIET, AND THE ARTS,

WITH

## COLOURED ENGRAVINGS.

BY JACOB BIGELOW, M. D.

RUMFORD PROFESSOR, AND PROFESSOR OF MATERIA MEDICA IN HARVARD UNIVERSITY.

VOL. III.

BOSTON:

PUBLISHED BY CUMMINGS AND HILLIARD, AT THE BOSTON BOOKSTORE, NO. 1 CORNHILL.

UNIV. PRESS....HILLIARD AND METCALF.

1820.

Mo. Bot. Garden,
1893

## PREFACE TO THE THIRD VOLUME.

THE subjects of the present work, for reasons which prevail in many publications of the kind, have been inserted without reference to any particular arrangement or system. Those plants received the earliest place, the observations respecting which were earliest matured, and the drawings of which were first completed. Although this plan has been objected to in some foreign criticisms, it is the one pursued in several of the most extensive and useful botanical works of the day, which are accompanied with plates; and in periodical publications, or those which appear in successive numbers, it has more than one decided advantage. It gives time for all the figures to be completed at leisure, from perfect specimens, in proper and convenient seasons; at the same time that it does not necessitate premature and imperfect descriptions of their subjects, which must take place were an arrangement adopt-

ed, which might require the first insertion for plants not yet obtained or imperfectly examined. A systematic method may be adhered to in a work which is furnished for the press at once, but must occasion delay and imperfection in a periodical one.

As the American Medical Botany is terminated by the completion of its third volume, the opportunity is now afforded for taking a methodical view of its contents. Considered in a medicinal point of view, the subjects will be best classed as in systems of Materia Medica, by a reference to their leading properties or most striking modes of operating on the human system. In this light they may be arranged as follows.

*Narcotics.*

Datura Stramonium,
Conium maculatum,
Cicuta maculata,
Hyoscyamus niger,
Nicotiana tabacum,
Solanum dulcamara,
Kalmia latifolia?

*Astringents.*

Geranium maculatum,
Statice Caroliniana,
Arbutus Uva ursi,
Rubus villosus,
Rhododendron maximum,
Nymphæa odorata,
Myrica cerifera.

*Tonics.*

Menyanthes trifoliata,
Humulus Lupulus,
Eupatorium perfoliatum,
Coptis trifolia,
Cornus florida,
Gentiana Catesbæi,
Aletris farinosa,
Polygala rubella,
Sabbatia angularis,
Prinos verticillatus,
Liriodendron tulipifera,
Magnolia glauca.

*Acrid stimulants.*

Arum triphyllum,
Ictodes fœtidus,
Ranunculus bulbosus.

*Emetics.*

Lobelia inflata,
Phytolacca decandra,
Gillenia trifoliata,
Veratrum viride,
Sanguinaria Canadensis,
Iris versicolor,
Apocynum androsæmifolium,
Dirca palustris,
Euphorbia ipecacuanha,
Euphorbia corollata.
Erythronium Americanum.

*Cathartics.*

Podophyllum peltatum,
Juglans cinerea,
Triosteum perfoliatum,
Cassia marilandica,

*Diaphoretics.*

Aristolochia serpentaria,
Asarum Canadense,
Xanthoxylum fraxineum,
Solidago odora,
Gaultheria procumbens,
Laurus sassafras,
Illicium Floridanum.

*Diuretics.*

Juniperus communis,
Pyrola Umbellata.

*Expectorants.*

Polygala senega,
Asclepias tuberosa.

*Demulcents.*

Panax quinqefolium.

*Anthelmintics.*

Spigelia marilandica.

*External stimulants.*

Juniperus Virginiana,
Rhus Vernix,
Rhus radicans.

We avail ourselves of classification in the Materia Medica founded on the kind of operation which medicines exert on the human body, because there are seemingly no better characteristics by which to arrange them. But even this method is defective, because few medicines are simple in their operation, and of course most of them have claims to stand in more than one class. As examples, Tobacco, Henbane, Fox-

glove, and Opium are all of them properly placed by authors under the head of Narcotics. But of these, Tobacco is an emetic, Henbane a cathartic, Foxglove a diuretic, and Opium, while it checks all other excretions, is itself sudorific. Mercury, under its different forms and modes of administration, is capable of fulfilling half a dozen different intentions. The classifier of medicines then can do no more than to arrange them by their most obvious and well known properties, whatever these may be, leaving it understood that the name of a class is by no means fully descriptive of the character of its contents.*

In forming a selection of sixty plants to be represented in this work, it has been endeavoured to choose those which are among the most interesting to botanists, at the same time that they possess claims upon the attention of medical men. It is by no means to be asserted that all these possess so decided an efficacy as to entitle them to the rank of standard medicines, or to make it advisable that pharmacopœias should be swelled by their introduction. A part of them no doubt are eminently entitled to this distinction. Others are efficacious only in a second degree,

* For a botanical arrangement of the plants, see the systematic index at the end of the volume.

but are still in use, and often advantageously so, in the hands of country practitioners. There are some of yet inferior efficacy, which, having formerly enjoyed a certain degree of medicinal notoriety, are inserted here with a view of defining their true character.

The progress of botanical students is much facilitated by the possession of correct drawings and dissections of a variety of dissimilar plants. In this country botanical figures, especially of American plants, are scarce, and accessible to but a small number of those who pursue this study. It is hoped that the present work may, in a certain degree, supply the deficiency, at least until the extension of natural science among us, and the increased number of botanical students, shall call forth and support works of greater magnitude.

A part of the plants contained in this work have never been figured in any botanical work. Others have been represented a great number of times; yet their importance, in a medical point of view, required their admission; and the figure being always made from an American specimen, it may, on this account, be not destitute of interest.

Having arrived at the termination of the American Medical Botany, the author feels it

incumbent on him to state, that he has at no time had cause to regret the undertaking of a work, which has furnished a most interesting employment for his leisure hours; and which has been honored with a patronage, greatly exceeding his anticipations.

PL. XLI.

*Gillenia trifoliata*

# AMERICAN MEDICAL BOTANY.

## GILLENIA TRIFOLIATA.

### *Common Gillenia.*

*PLATE XLI.*

NOTWITHSTANDING the principle avowed by Linnæus, that genera are formed by nature; the determination of generic consanguinity in species occasions in many instances one of the greatest perplexities of the botanist. What difference in structure and external form either of flower or fruit, is sufficient to separate families of plants from each other; is a point often difficult to decide; and is perhaps as frequently set at rest by convenience and by arbitrary decision, as it is by any unexceptionable boundaries designated in nature. When the species of a vegetable order are exceedingly numerous, and a close similarity pervades the whole; genera are multiplied by botanists, that the discrimination of species may be facilitat-

ed. On the other hand, where a group of species is not unwieldy from its size, or deficient in distinctive marks, the genera are made as comprehensive, as natural affinity will permit. The diversity of structure, which exists in the flowers of *Gentiana*, or the fruit of *Bunias*, would be deemed ample foundation for constructing half a dozen genera among the umbelliferous, leguminous, or gramineous orders. But as the species of the genera above have a strong agreement in one part of their fructification, as well as in general habit, and as no great obscurity or inconvenience results from keeping them together, it has not been thought worth while to multiply nomenclature by arranging them under separate titles.

The separation of Gillenia from Spiræa is one of those cases, upon which the botanist may hesitate long, without finding reasons strong enough to influence his decision. The natural order to which they belong is remarkable for having its genera well defined, so that there is no necessity for the separation, arising from confusion or indistinctness. The fruit of Gillenia is exactly the fruit of Spiræa, and the habit of the herb in one is not very foreign from that of the other. There is nevertheless something in the irregular corolla, taken in conjunction with the campanulate calyx,

which I think would prevent any one, at first sight, from considering the plant a Spiræa; and which may afford sufficient ground for following the example of Mœnch in considering it a distinct genus.

The Gillenia trifoliata grows in woods, in a light soil, from Canada to Florida. In the maritime states I have not met with it north of the Hudson. Its flowering time is in June and July.

The generic character, which distinguishes this plant from Spiræa, is as follows: *Calyx campanulate, five toothed; corolla irregular, petals lanceolate, contracted near the claws; capsules five,* The species *trifoliata* has *ternate, lanceolate, serrate leaves, and stipules which are minute, linea-lanceolate* and *nearly entire.*

Class *Icosandria*, order *Pentagynia.* Natural orders *Senticosæ*, Lin. *Rosaceæ*, Juss.

This plant has commonly a number of stems from the same root, which are a foot or two in height, erect, slender, flexuous, smooth, commonly of a reddish tinge, and considerably branched. The leaves are alternate, trifoliate, with very short petioles, furnished with small lanceolate, slightly toothed stipules at the base. Leafets ovate, lanceolate, acuminate, sharply toothed, the upper ones often single. The flowers are few in num-

ber, scattered, terminal, nodding, forming a sort of panicle, with long peduncles, occasionally furnished with minute lanceolate bractes. Calyx subcampanulate, or tubular, with the lower half narrowest, the border divided into five reflexed acute teeth. Petals five, the two upper ones separated from the three lower, white, with a reddish tinge on the edge of the outside, lanceolate, unguiculate, contracted, and approximated at base. Stamens about twenty in a double series within the calyx. Germ round, styles approximated. Capsules five, not *one*, as some authors have stated, diverging, oblong, acuminate, gibbous without, sharp edged within, two valved, one celled, one or two seeded; seeds oblong, corresponding in shape to the capsule.

The root of this plant is much branched and knotty. It consists of a woody portion, invested with a thick bark, which when dry is brittle, and very bitter to the taste. The predominant, soluble ingredients in this root appear to be a bitter extractive matter, and resin. When boiled in water, it imparts to it a beautiful, deep red, wine colour, and an intensely bitter taste. This decoction undergoes no change from alcohol or gelatine, though it gives a precipitate with muriate of tin. Water distilled from the root has its peculiar

flavour, with little of the bitterness. A large portion of resin is precipitated on the addition of water to an alcoholic tincture of the root.

Under the name of Spiræa trifoliata, this plant is well known to students of the American Materia Medica, as an emetic. To the remarks which have been made by various writers, I can add my own testimony of its possessing properties in a certain degree analogous to those of ipecacuanha. It requires, however, a larger dose, and I have not been satisfied that it is at all certain in its operation. At times I have known fifteen grains to produce a full operation; at others thirty grains have been given to a person already predisposed to vomit, without producing the least sensible effect.

The best printed account which I have found respecting its mode of operation is contained in an Inaugural Dissertation, published at Philadelphia in 1810, by Dr. De la Motta, then of Charleston, S. C. This gentleman, in addition to other trials, took the root himself twice in sufficient quantity to produce vomiting. "In order," he says, "to ascertain this particular power of the Spiræa, I, early in the morning, fasting, prescribed for myself twenty-five grains of the powdered root of this plant. I divided this quantity into four

equal parts, one of which I took every fifteen minutes, conceiving this a sufficient length of time to allow for the action of each dose in my stomach. The first dose taken produced no manifest effect. At the expiration of fifteen minutes I took a second dose;—a degree of uneasiness was experienced, attended with some nausea;—at the end of fifteen minutes more I swallowed a third dose,—nausea increased, until the convulsive action of my stomach took place. The fourth dose was now taken; considerable efforts were made to vomit, and finally the contents of my stomach were thrown up, together with a profuse quantity of bile. The determination of blood to my head, the frequency of my pulse, and heat of my system were much augmented. I now drank half a pint of warm water; the action of my stomach subsided, and the nausea gradually wore off. A portion of the medicine, I was induced to believe, had insinuated itself into the intestines, as two copious evacuations were produced within the space of three hours. During the day I felt much debilitated, but imputed this to the general effect of emetics.

"I was thus satisfied with respect to its efficacy as an emetic upon an empty stomach. But, being still desirous of becoming better acquainted with

its particular operation after eating an usual meal, I made a second experiment, one month after the first. In the morning, one hour after I had eaten a hearty breakfast, I took twenty grains of the medicine, in divided doses, as in the former experiment. At the expiration of a very few minutes nausea commenced, which continuing to increase, with very few efforts I discharged the contents of my stomach. The effects of the second trial answered exactly my expectations."

Some authors have attributed a tonic power to the Gillenia, when administered in small doses. That it possesses such a power is rendered probable by its bitter taste, and by the fact, that small doses of ipecacuanha exert a beneficial stimulus on the stomach in certain cases of debility in that organ.

## BOTANICAL REFERENCES.

Gillenia trifoliata, Mœnch, *Meth. suppl. p.* 286.—Nuttall, *Genera*, i. 307.—Spiræa trifoliata, Lin.—Willd. *Sp. pl.* ii. 1063.—Curtis, *Bot. Mag. t.* 489.—Miller, *Icones*, 256.—Michaux, *Flor.* i. 294.—Pursh, i. 243.

## MEDICAL REFERENCES.

Schœpf, 80.—B. S. Barton, *Coll.* 26.—De la Motta, *Inaugural Dissertation.*

## PLATE XLI.

Fig. 1. *Gillenia trifoliata.*
Fig. 2. *Calyx.*
Fig. 3. *A petal.*
Fig. 4. *Flower opened, shewing the situation of the stamens.*
Fig. 5. *Germ and styles.*
Fig. 6. *Styles separated.*

*Rhus radicans*

# RHUS RADICANS.

## *Poison Ivy.*

=

### *PLATE XLII.*

LIKE the Rhus vernix, described in our first volume, this plant is regarded with aversion, and too frequently furnishes cause to be remembered by persons of susceptible constitution, who unwarily become exposed to its poisonous influence. The general recognition of its deleterious character is evinced in the application of the names *Poison vine*, *Poison creeper*, and *Poison Ivy*, which are given to it in all parts of the United States.

The Rhus radicans is a pretty common inhabitant of the borders of fields and of woods in most soils which are not very wet. Its mode of growth is much like that of the common creeper, the Ampelopsis quinquefolia of Michaux; and like that vine, and the European Ivy, it would doubtless be cultivated for ornament, were

it harmless as it is handsome. As its name implies, this vine ascends upon tall objects in its neighbourhood by means of strong lateral rooting fibres, which project in great numbers from its sides, and attach themselves to the bark of trees and the surface of stones. The extreme branches of these fibres appear very strong in proportion to their fineness, and insinuate themselves into the minutest pores and crevices. The adhesion of the vine to the bark of trees is frequently so strong, that it cannot be torn off without breaking, and I have repeatedly seen large stems of the Rhus completely buried in the trunks of old trees, the bark having grown over and enveloped them. The fibres are analogous in their structure to fine roots, and consist of a regular wood and bark. They are sometimes thrown out in such numbers on all sides, as to give the vine a shaggy appearance and conceal its bark. In general, however, they tend to the shady side, and are attracted toward opaque objects, furnishing an exemplification of Mr. Knight's beautiful explanation of motion in tendrils, which, by their propensity to avoid the light and approach the shade, are directed into contact with bodies capable of yielding them support.

The size of the stem in this vine is commonly not more than an inch. Sometimes, however, in very old plants, it is found several times as large. It is usually compressed on the side which adheres to the support. In favourable situations it ascends to the tops of the highest rocks and trees, and is often seen restoring to decayed trunks the verdure which they have lost. When it does not meet with an elevated prop, the plant becomes stunted in its growth, is more branched, and affects a spiral mode of growth; or falls to the ground, takes root and rises again.

The genus Rhus is placed by Linnæus in the class *Pentandria*, and order *Trigynia*. The present species, however, is diœcious, a fact which is also true of most of the American species of Rhus which I have examined. The Rhoes belong to the Linnæan natural order *Dumosæ*, and to the *Terebintaceæ* of Jussieu.

The leaves of the Rhus radicans are ternate, and grow on long semicylindrical petioles. Leafets ovate or rhomboidal, acute, smooth and shining on both sides, the veins sometimes a little hairy beneath. The margin is sometimes entire and sometimes variously toothed and lobed, in the same plant. The flowers are small and greenish white. They grow in panicles or

compound racemes on the sides of the new shoots, and are chiefly axillary. The barren flowers have a calyx of five erect, acute segments, and a corolla of five oblong recurved petals. Stamens erect with oblong anthers. In the centre is a rudiment of a style.—The fertile flowers, situated on a different plant, are about half the size of the preceding. The calyx and corolla are similar but more erect. They have five small, abortive stamens and a roundish germ surmounted with a short, erect style, ending in three stigmas. The berries are roundish and of a pale green colour, approaching to white.

A plant has long appeared in the Pharmacopœias under the name of *Rhus toxicodendron.* Botanists are not agreed whether this plant is a separate species from the one under consideration, or whether they are varieties of the same. Linnæus made them different with the distinction of the leaves being naked and entire in Rhus radicans, while they are pubescent and angular in Rhus toxicodendron. Michaux and Pursh, whose opportunities of observation have been more extensive, consider the two as mere local varieties; while Elliott and Nuttall still hold them to be distinct species. Among the plants which grow abundantly around Boston, I have

frequently observed individual shoots from the same stock having the characters of both varieties. I have also observed that young plants of Rhus radicans frequently do not put out rooting fibres until they are several years old, and that they seem, in this respect, to be considerably influenced by the contiguity of supporting objects.

The wood of the Poison Ivy is brittle, fine grained and white, with a yellow heart in the old plants.

If a leaf or stem of this plant be broken off, a yellowish milky juice immediately exudes from the wounded extremity. After a short exposure to the air, it becomes of a deep black colour and does not again change. This juice, when applied to linen, forms one of the most perfect kinds of indelible ink. It does not fade from age, washing, or exposure to any of the common chemical agents. I have repeatedly, when in the country, marked my wristband with spots of this juice. The stain was at first faint and hardly perceptible, but in fifteen minutes it became black, and was never afterwards eradicated by washing, but continued to grow darker as long as the linen lasted.

Dr. Thomas Horsfield, in his valuable dissertation on the American species of Rhus, made

various unsuccessful experiments with a view to ascertain the nature of this colouring principle, and the means of fixing it on stuffs. He found that the juice, expressed from the pounded leaves, did not produce the black colour, and that strong decoctions of the plant, impregnated with various chemical mordants, produced nothing more than a dull yellow, brownish or fawn colour. The reason of this is, that the colouring principle resides not in the sap, but in the *succus proprius* or peculiar juice of the plant, that this juice exists only in small quantity, and is wholly insoluble in water, a circumstance which contributes to the permanency of its colour, at the same time that it renders some other medium necessary for its solution.

With a view to ascertain the proper menstruum for this black substance, I subjected bits of cloth stained with it, to the action of various chemical agents. Water, at various temperatures assisted by soap and alkali, produced no change in its colour. Alcohol, both cold and boiling, was equally ineffectual. A portion of the cloth, digested several hours in cold ether with occasional agitation, was hardly altered in appearance. Sulphuric acid reddened the spots, but scarcely rendered them fainter. The fumes of oxymuriatic

acid which bleached vegetable leaves and bits of calico in the same vessel, exerted no effect on this colour.

Boiling ether is the proper solvent of this juice. A piece of linen spotted with the Rhus was immersed in ether and placed over a lamp. As soon as the fluid boiled, the spot began to grow fainter, and in a few minutes was wholly discharged, the ether acquiring from it a dark colour. The linen at the same time became tinged throughout with a pale greyish colour, acquired from the solution.

This nigrescent juice, in common with that of the Rhus vernix, has, perhaps, claims to be considered a distinct proximate principle in vegetable chemistry.

The leaves and bark are astringent to the taste, which quality appears to be occasioned by gallic acid rather than tannin. The infusion and decoction become black on the addition of salts of iron, but discover hardly any sensibility to gelatin.

A poisonous quality exists in the juice and effluvium of this plant, like that which is found in the Rhus vernix already described. It is said, that some other species of Rhus, such as Rhus pumilum and Rhus typhinum, possess the same

property in a greater or less degree. The poison Ivy, however, appears to be less frequently injurious than the poison Dogwood, and many persons can come in contact with the former with impunity, who are soon affected by the latter. I have never, in my own person, been affected by handling or chewing the Rhus radicans, though the Rhus vernix has often occasioned a slight eruption. Indeed, the former plant is so commonly diffused by road-sides and near habitations, that its ill consequences must be extremely frequent, were many individuals susceptible of its poison.

Those persons who are constitutionally liable to the influence of this poison, experience from it a train of symptoms very similar to those which result from exposure to the Rhus vernix. These consist in itching, redness and tumefaction of the affected parts, particularly of the face; succeeded by blisters, suppuration, aggravated swelling, heat, pain, and fever. When the disease is at its height, the skin becomes covered with a crust, and the swelling is so great as in many instances to close the eyes and almost obliterate the features of the face. The symptoms begin in a few hours after the exposure, and are commonly at the height on the fourth or fifth day; after which, desquamation begins to take place, and the distress, in most instances, to diminish.

Sometimes the eruption is less general, and confines itself to the part which has been exposed to contact with the poison. A gentleman, with whom I was in company, marked his wristband with the fresh juice, to observe the effect of the colour. The next day his arm was covered with an eruption from the wrist to the shoulder, but the disease did not extend further. It sometimes happens that the eruption continues for a longer time than that which has been stated, and that one set of vesications succeeds another, so as to protract the disease beyond the usual period of recovery.

The symptoms of this malady, though often highly distressing, are rarely fatal. I have nevertheless been told of cases in which death appeared to be the consequence of this poison.

The disease brought on by the different species of Rhus appears to be of an erysipelatous nature. It is to be treated by the means which resist inflammation, such as rest, low diet, and evacuations. Purging with the neutral salts is peculiarly useful, and in the case of plethoric constitutions, or where the fever and arterial excitement are very great, blood-letting has been found of service.

The extreme irritability and burning sensation may be greatly mitigated by opium. Cold

applications, in the form of ice or cold water, are strongly recommended by Dr. Horsefield in his treatise, and when persevered in, they appear to exert a remarkably beneficial effect. The acetate of lead is perhaps as useful as any external palliative, and it should be used in solution rather than in the ointment, that it may be applied as cold as possible. The late Dr. Barton speaks highly of a solution of corrosive sublimate externally applied in this disease, but from trials of the two remedies made at the same time and in the same patient, I have found the lead the more beneficial of the two.

A person who has been in contact with the Rhus and finds himself poisoned, should immediately examine his hands, clothes, &c. to see if there are no spots of the juice adhering to him. These, if present, should be removed, as they will otherwise serve to keep up and extend the disorder. From a want of this precaution, the disease is frequently transferred from the hands to different parts of the body, and likewise kept up for a longer time than if the cause had been early removed. As washing does not eradicate the stains of this very adhesive juice, it is best to rub them off with some absorbent powder.

The Rhus radicans has been administered internally in certain diseases by a few practitioners in Europe and America. Dr. Horsefield, in several instances, administered a strong infusion in the dose of about a teacup full to consumptive and anasarcous patients. It appeared to act as an immediate stimulant to the stomach, producing some uneasiness in that organ, also promoting perspiration and diuresis. Some practitioners in the Middle States, we are told by the same author, have exhibited it with supposed benefit in pulmonary consumption. A French physician, Du Fresnoy, has reported seven cases of obstinate herpetic eruption, which were cured by the preparations of this plant. His attention was drawn to the subject by finding that a young man who had a *dartre* upon his wrist of six years' standing, was cured of it by accidentally becoming poisoned with this plant. The same physician administered the extract in several cases of palsy, four of which, he says, were cured by it.

Dr. Alderson, of Hull, in England, gave the Rhus toxicodendron in doses of half a grain, or a grain three times a day, in several cases of paralysis; and states, that all his patients recovered, to a certain degree, the use of their limbs.

The first symptom of amendment was an unpleasant feeling of prickling or twitching in the paralytic limbs. Dr. Duncan, author of the Edinburgh Dispensatory, states, that he had given it in larger doses without experiencing the same success, although he thinks it not inactive as a medicine.

My own opinion is, that the plant under consideration is too uncertain and hazardous to be employed in medicine, or kept in apothecaries' shops. It is true, that not more than one person in ten is probably susceptible of poison from it. Yet, even this chance, small as it is, should deter us from employing it. In persons not constitutionally susceptible of the eruptive disease, it is probably an inert medicine, since we find that Du Fresnoy's patients sometimes carried the dose as high as an ounce of the extract, three times a day, without perceiving any effect from it.

It is true that the external application of the Rhus radicans and Rhus vernix would, in certain cases, afford a more violent external stimulus, than any medicinal substance with which we are acquainted. But since it is neither certain in its effect, nor manageable in its extent, the prospect of benefit, even in diseases like palsy and mania, is not sufficient to justify the risk of great evil.

## BOTANICAL REFERENCES.

Rhus radicans, WILLD. *Sp. pl.* i. 1481.—ELLIOTT, i.—Rhus toxicodendron, &c. MICHAUX, *Flor.* i. 183.—PURSH, i. 205.—Toxicodendron rectum &c.—DILLENIUS, *Elth. t.* 291.

## MEDICAL REFERENCES.

DU FRESNOY, *quoted in Annals of Medicine*, iv. 182.—v. 483.—Med. and Phys. Journal, i. 308.—vi. 273.—x. 486.—DUNCAN, *Dispens.* 294.—HORSEFIELD, *Dissertation, Philad.* 1798.

## PLATE XLII.

Fig. 1. *Rhus radicans, the barren plant in flower.*
Fig. 2. *Fruit.*
Fig. 3. *Barren flower.*
Fig. 4. *Fertile flower.*
Fig. 5. *Petal.*
Fig. 6. *Stamens and rudiment of a style in the barren flower.*
Fig. 7. *Germ, style and abortive stamens in the fertile flower.*

# MYRICA CERIFERA.

## *Wax Myrtle.*

=

## *PLATE XLIII.*

Almost every region of the United States produces varieties of the Wax myrtle. Michaux considers them all as belonging to one species, a conclusion which is warranted by the great number of intermediate sizes, and forms of leaf, which may be observed between the different extremes. Pursh, however, has chosen to distinguish three species which bear wax, and which he names *cerifera* after Linnæus, *Caroliniensis* from Willdenow, and *Pennsylvanica* from Lamarck. The *Wax myrtle* or *Bayberry*, as it is often called, which is common in New England, varies in height from one to seven or eight feet. It is found in every kind of soil from the borders of swamps to the tops of barren hills, and is very much influenced in its size and appearance, by the place in which it happens to grow.

PL. XLIII

Myrica cerifera

The genus Myrica belongs to the class *Diœcia* and order *Tetrandria*. It is also ranked among the *Amentaceæ* of Linnæus and Jussieu.

The generic character consists in an *imbricated ament; the scales without a corolla; the barren flowers containing four anthers, the fertile ones two styles. Fruit, one seeded.*—The specific character, as given by Michaux, is as follows. *Leaves wedge-lanceolate, with a few serratures at top; barren aments lax; fruit spherical, naked, distinct.*

The Wax myrtle is found bearing fruit at every size, from the height of one foot, to six or eight. In Louisiana, it is said to grow to twelve feet. The top is much branched, and covered with a grayish bark. The leaves are wedge-lanceolate, varying in width, sometimes entire, but more frequently toothed, particularly toward the end. They are somewhat pubescent, a little paler beneath, and generally twisted, or revolute in their mode of growth. They are inserted in a scattered manner by short petioles. The flowers appear in May before the leaves are fully expanded. The barren ones grow in catkins, which are sessile, erect, about half an inch or three quarters long; originating from the sides of the last year's twigs. Every flower is formed by a

concave rhomboidal scale, containing three or four pairs of roundish anthers on a branched footstalk. The fertile flowers, which grow on a different shrub, are less than half the size of the barren ones, and consist of narrower scales, with each an ovate germ, and two filiform styles.

To these aments succeed clusters or aggregations of small globular fruits resembling berries, which are at first green, but finally become nearly white. They consist of a hard stone inclosing a dicotyledonous kernel. This stone is studded on its outside with small black grains resembling fine gun-powder, over which is a crust of dry white wax, fitted to the grains and giving the surface of the fruit a granulated appearance. Botanically speaking, this fruit has been improperly called a berry, and a drupe; since it is always dry and never invested with a cuticle, or any thing but the grains and wax.

Every young part of the Wax myrtle has a fragrant, balsamic smell, which it communicates to the fingers when rubbed by them. This appears to be derived from a resinous exudation, which may be seen in minute points of a bright transparent yellow, covering the young shoots and under surface of the leaves. In the berries this resinous substance is within the wax.

The bark and leaves of the Myrica cerifera contain gallic acid, tannin, resin, and a small quantity of mucilage, which are manifested by their usual tests.

The wax of the Myrica is obtained for common purposes by boiling large quantities of the berries in kettles with water enough to cover them to the depth of several inches. The berries, which float at first, gradually subside to the bottom when the wax is melted off, which latter substance floats on the surface. When the boiling has been continued long enough to divest the berries of most of their wax, the liquid is suffered to cool, and the wax concretes on the top. It is purified by melting it anew, and is then cast into masses.

In this state it is of a greenish gray colour, with a consistence which is intermediate between that of bees wax and tallow, being brittle and not remarkable for adhesiveness or unctuosity. It burns with a white flame, which is less vivid than that of tallow or whale oil.

The chemical properties of this wax have been examined by M. Cadet, in France, and Dr. Bostock, in England. From their experiments, we learn that water has no action on the Myrtle wax, either cold or at the boiling heat. Dr.

Bostock informs us that alcohol, at the ordinary temperature of the atmosphere, has no action upon it; but one hundred parts by weight of the fluid, when boiling, dissolve about five parts of the wax. About four fifths of this is deposited by cooling, and the rest is slowly deposited in a few days, or may be precipitated by water. Of the mass of wax, a certain portion remains insoluble in alcohol.

Sulphuric ether, according to Dr. Bostock, dissolves but little of the wax, when cold, but acts upon it rapidly, when boiling, taking up somewhat more than one quarter of its own weight. Upon evaporation, the wax is deposited in a crystalline or lamellated form, its texture resembling that of spermaceti.—Rectified oil of turpentine, when assisted by heat, dissolves about six per cent of its own weight, most of which is deposited on cooling.—Pure potash, in water, renders the wax colourless by boiling, and forms a soap with a small part, which may be decomposed by an acid, and affords the wax nearly unchanged.—The sulphuric acid, assisted by heat, dissolves about one twelfth of its own weight, and forms a dark brown mass. The nitric and muriatic acids exert very little action upon it. Dr. Bostock considers the Myrtle wax to be a fixed vegetable oil, rendered concrete by oxygen.

M. Cadet, in addition to many of the above characteristics of Myrtle wax, found that it combined readily with the semivitreous oxyde of lead, forming a very hard plaister. When distilled in a retort, the wax was partly decomposed, and a portion which passed over was white and of a soft consistence. Oxygenated muriatic acid bleaches it, but with more difficulty than bees wax.

The experiments which I have made on this substance confirm the preceding statements with the following exceptions. Cold alcohol dissolves a minute portion, which is gradually separated by the addition of water, and floats in perceptible *flocci*, near the surface. Cold ether dissolves about one sixteenth of its weight. This it does with great rapidity, and if thin shavings of the wax be dropped into a vessel of ether, they disappear almost immediately.

Dr. J. F. Dana has published, in Silliman's Journal, an account of some experiments made to ascertain the proportion of wax, and of the other parts which compose the entire berry. He found the wax to constitute nearly a third of the whole, or thirty two per cent; the kernels 47.00, the black powder 15.00. with about 5.00 of a resino-extractive matter.

There undoubtedly exists, in the berries of this shrub, some interesting constituents beside the wax and insoluble portions, as the following results will show. If water be distilled from the fresh berries, it acquires a slight pearly appearance and a fine aromatic odour and taste. This indicates the presence of a volatile oil, though I have not performed the experiment sufficiently in the large way to obtain any oil separate. The decoction remaining in the retort gives proofs of gallic acid.

When the wax, in a separate state, is boiled in alcohol, a portion is dissolved, which is mostly deposited on cooling, leaving the fluid clear. But if alcohol be boiled upon the berries till a strong solution is formed, it does not give a deposit on cooling, but the solution coagulates into a soft solid and remains afterwards unaltered. This coagulum is readily soluble in cold ether, and melts when exposed to heat. If the berries be boiled in water until the wax is melted and principally detached, the remaining parts still give a coagulating solution with alcohol.—The tincture made by digesting cold alcohol on the bruised berries is considerably coloured, and becomes turbid on the addition of water, but whether the resinous substance thus precipitated

is the same in small quantity, which produces the coagulation in a large one; I am not prepared to say.

It appears, then, that there exists in the berries of the Myrica a peculiar vegetable principle, bearing nearly the same relation to alcohol, as starch and gelatin do to water. I have not yet obtained it in a separate state, and cannot therefore give any additional characteristics to those which have been already stated.

The Myrtle wax is useful for many of the purposes for which bees wax and tallow are employed, particularly for candles. It burns with a clear flame, though less vivid than that of common oil, and emits a considerable fragrance. It was formerly much in demand as an ingredient in a species of blacking ball, to which it communicated a temporary lustre and power of repelling water. It has occasionally been used in pharmacy in various compositions intended for external use, and is mild or stimulating according as it is more or less pure and freed from the colouring matter.

In some parts of Europe plantations of this shrub have been raised with a view to the profit to be derived from the wax. In this country, where the shrub abounds, the berries are often

neglected, their collection and the separation of the wax being deemed too laborious to compensate the trouble.

In Dr. Thatcher's Dispensatory, we are informed, on the authority of Dr. Mann, that the bark of the root of the Myrica cerifera is emetic. With a view to examining thoroughly its medicinal properties, Dr. S. L. Dana, in 1818, made it the subject of an inaugural dissertation. He found that the powdered bark was acrid and astringent, but did not appear to possess any other qualities than were attributable to those two. Moderate doses of the powder and decoction produced no effect on the stomach or bowels. Large doses, for instance two scruples, were swallowed with difficulty on account of their acrimony, and occasioned heat and nausea at the stomach. Larger doses, of a drachm, produced a powerful burning sensation and vomiting. Costiveness generally followed the use of this medicine. The powder, when snuffed up the nose, proved powerfully sternutatory, and when applied to the fungous granulations of an ulcerated leg, it produced so much pain as compelled the patient to wash it off.

We may then consider the bark of the Myrica as an acrid stimulant and astringent. That it

sometimes proves emetic, in large doses, is to be explained in the same way as the operation of mustard and horse-radish, which some of the older physicians employed as emetics. When the stomach is burdened with an undue quantity of stimulus, it naturally tends to relieve itself by vomiting.

On the whole, we are to esteem the Myrica cerifera as more interesting in a chemical, than a medical point of view. The pleasant aroma of the water distilled from the berries, and the application of the wax to some purposes of pharmacy, are all, that this shrub at present offers, much deserving the attention of physicians.

## BOTANICAL REFERENCES.

Myrica cerifera, Willd. iv. 745.—Michaux, ii. 227.—Pursh, ii. 620.—Myrtus foliis lanceolatis, &c.—Gronovius, 155.—Myrtus brabanticæ similis, &c.—Catesby, i. 13?

## MEDICAL AND CHEMICAL REFERENCES.

Cadet, *translated in Nicholson's Journal*, 8vo. *vol.* iv. 187.—Bostock, in ditto, 129.—Kalm, *Travels*, i. 129.—Dana, *in Silliman's Journal*, vol. i.—Thacher, *Disp.* 288.

## PLATE XLIII.

Fig. 1. *Myrica cerifera, with fruit not fully ripe.*
Fig. 2. *A barren branch in flower.*
Fig. 3. *Fertile ditto in flower.*
Fig. 4. *A barren flower.*
Fig. 5. *The same with the scale turned down, shewing the mode of growth of the anthers.*
Fig. 6. *Fertile flower.*
Fig. 7. *Fruit somewhat magnified.*

*Juniperus communis*

# JUNIPERUS COMMUNIS.

## *Common Juniper.*

=

### *PLATE XLIV.**

THE prostrate variety of the common Juniper is so peculiar in its mode of growth, that it has some claims to be considered a distinct species. On comparing it, however, with European specimens, I find the similarity so great, that I do not see sufficient grounds for separating it, especially as there are, in Europe, several varieties in size and mode of growth, which are not recognized as separate species. The variety, which is the only one I have met with in the Northern States, is a large trailing shrub, continually throwing out roots from its branches, and spreading in all directions until it forms beds, which are many rods in circumference. In this way it continues to advance outward, supporting itself by new roots even after the original trunks, at the centre,

* Very beautiful drawings, from which this and the following plate are engraved, were sent me by a lady in Hampshire county.

are dead and decayed. It seldom rises more than two or three feet from the ground.

The genus *Juniperus* belongs to the class *Diœcia*, order *Monadelphia*, and natural order *Coniferæ* of Linnæus and Jussieu. It is distinguished by an *ovate ament with peltate scales, which, in the barren flowers, are whorled in threes, with from two to four anthers; in the fertile ones opposite. Berry three seeded.*—In the common Juniper, *the leaves are ternate, spreading, mucronate, larger than the berry.*

The Juniper is with us always a shrub, never rising into a tree. The tips of the branches are smooth and angular. The leaves grow in threes and are linear-acerose, sharply mucronate, shining green on their lower surface, but with a broad glaucous line through the centre of the upper. These leaves, however, are always resupinate, and turn their upper surface toward the ground. The barren flowers grow in small axillary aments, with roundish, acute, stipitate scales, inclosing several anthers. The fertile flowers, growing on a separate shrub, have a small, three parted calyx growing to the germ; and three styles. The fruit is a fleshy, roundish, oblong berry, of a dark purplish colour, formed of the germ and confluent calyx, marked with three prominences or

vesicles at top, and containing three seeds. It requires two seasons to arrive at maturity from the flower.

The leaves of the Juniper have a strong and rather unpleasant taste, with a little astringency. The peculiar juice of the bark appears to consist of resin and volatile oil. Gum Sandarach, which furnishes the material of pounce, is obtained from the European Juniper, from which it exudes spontaneously through crevices and perforations in the bark.

The part principally used in medicine is the berries. These have a strong peculiar taste, accompanied with considerable sweetness. When long chewed, they leave an impression of bitterness. The sweetness appears to reside in the pulp, the bitterness in the seeds, or in their immediate investment, and the aromatic flavour in the essential oil. Dr. Lewis observes, that tinctures, made with these berries, differ according as they are prepared with the berries entire or bruised.

When of a good quality these berries yield, in distillation, a large quantity of pungent, volatile oil of a peculiar flavour, the same which it communicates to gin. The medicinal powers, for which this article is employed, may be considered as residing in this oil.

The berries of the Juniper have long been employed for the purposes of a diuretic, particularly in dropsy. Many of the older writers, whose names are of high authority in medicine, have given favorable reports of the operation of this medicine in hydropic cases. It has been used in substance, in infusion, and in various compound medicines. The effects of its most popular preparation, that of an ardent spirit, are too universally known to require particular elucidation. In addition to the specific effect of the essential oil, some physicians have attributed virtues to the rob, or inspissated decoction of the berries. Hoffman found it of great use in debility of the stomach and intestines, particularly in old people. The stronger preparations have been found useful in uterine obstructions, and in paralytic affections of the vesica urinaria.

Linnæus informs us, in his Flora Lapponica, that a fermented decoction of Juniper berries is used in Sweden as a common drink, but he denies the infusion being substituted for tea and coffee, as some writers have stated, in Lapland. Woodville and others have misquoted him on this point.

The American Juniper berries are considerably inferior to the European in strength and

flavour. The best of the latter are said to be from Italy. But of the imported specimens, which I have examined at the druggists' shops in this country, very few possess any remains of the original strength, and much the greater portion of them appear to have undergone at least one distillation, before their exportation from Europe. The best Juniper berries have a strong impregnation of volatile oil, which, having been once tasted, cannot be easily mistaken. Those which have been subjected to distillation are dry and tasteless.

## BOTANICAL BEFERENCES.

Juniperus communis, Linn.—Smith, *Flor. Brit.* iii. 1085.—*Engl. Bot. t.* 1100.—Woodville, ii. *t.* 95.—Michaux, ii. 245.—Pursh, ii, 646.—Blackwell, *t.* 187.

## MEDICAL REFERENCES.

Murray, *App. Med.* i. 34.—Lewis, *Disp.* 240.—Linnæus, *Flora Lapp.* 376.—Woodville, *ut supra.*

## PLATE XLIV.

Fig. 1. *A branch of Juniperus communis in fruit.*

Fig. 2. *A barren twig in flower.*

Fig. 3. *Barren ament.*

Fig. 4. *Scale of anthers of the same.*

Fig. 5. *Fertile flower.*

*Juniperus virginiana*

# JUNIPERUS VIRGINIANA.

## *Red Cedar.*

=

*PLATE XLV.*

UNLIKE the subject of the preceding article, this species rises into a tree of considerable size. It is the largest of the Junipers growing within the original limits of the United States, though it appears that Lewis and Clarke brought home specimens of a lofty tree, with foliage resembling the Savin, found on the banks of streams among the Rocky mountains, and which is supposed to be the same with J. excelsa, growing in Siberia.

Michaux, in his North American Sylva, informs us, that it is found from Maine and from Lake Champlain, without interruption to the Cape of Florida. In the Middle and Northern states, it frequents the most barren soils, being found in abundance upon dry, rocky hills, where scarcely any other tree can subsist. Its size, however, is said to be here inferior to that which it attains in Virginia, and farther south.



MISSOURI
BOTANICAL
GARDEN.

Its habit and foliage abundantly distinguish it from the species in the last article. From the Juniperus Sabina, or common Savin of Europe, its botanical distinction is by no means easy. The general appearance and arrangement of the leaves in the full grown specimens of both is precisely the same, except that in the Red cedar the leaves are shorter and more compactly imbricated, having an ovate form, while in the Savin they are somewhat longer and more remote, and may be called lanceolate. In the Red cedar they are also more universally and pungently acute. The characters of the latter species, which I have seen given by different botanists, are almost all defective, in ascribing to it ternate leaves, which, I believe, never exist except in imperfect or distorted specimens. Its more true character is as follows. *Trunk arboreous, upper leaves imbricated in four rows, ovate, pungently acute.* It is by no means certain that on mature examination all the present species of Juniper will be found sufficiently distinct to be kept separate.

The Red cedar, when full grown, is a middling sized tree, though, on account of the value of its wood, it is seldom suffered to reach its full dimensions. The trunk is straight and decreases rapidly

from the ground, giving off many horizontal branches. Its surface is generally unequal, and disfigured by knots, and the crevices and protuberances they occasion. The small twigs are cov ered with minute, densely imbricated leaves, which continue to increase in size as the branch grows, till they are broken up and confounded with the rough bark. These leaves are fleshy, ovate, concave, rigidly acute, marked with a small depressed gland on the middle of their outer side, growing in pairs, which are united at base to each other, and to the pairs above and below them. They do not alter their situation, but continue opposite till they are obliterated by age. A singular variety sometimes appears in the young shoots, especially those which issue from the base of the trees. This consists in an elongation of the leaves to five or six times their usual length, while they become spreading, acerose, considerably remote from each other, and irregular in their insertion, being either opposite or ternate. These shoots are so dissimilar to the parent tree that they have repeatedly been mistaken for individuals of a different species.—The barren flowers grow in small oblong aments, formed by peltate scales with the anthers concealed within them. The fertile flowers have a proper perianth, which

coalesces with the germ and forms a small roundish berry, with two or three seeds, covered on its outer surface with a bright blue powder.

The leaves of the Red cedar have a strong disagreeable taste, with some pungency and bitterness. The peculiar taste and odour reside, no doubt, in a volatile oil, which, however, is not readily separated by distillations in a small way. The tincture becomes turbid when water is added, and very much so if suffered to stand a day or two. The presence of tannin is developed by the admixture of dissolved isinglass, with a decoction of the bark and leaves.

The botanical similarity of this tree to the *Savin*, which is an European shrub, has already been mentioned. In their sensible and medicinal properties, they are equally allied. The taste of the two species is nearly the same, except that the cedar leaves are the more nauseous of the two. As the American tree is frequently known throughout the country by the name of Savin, our apothecaries have been led to presume upon its identity with that medicine, and it has long been used in cases where the true Savin is recommended. Its most frequent use, however, is in the composition of the cerate employed for keeping up the irritation and discharge of blisters.

This preparation is the same with the Savin cerate, used in Europe, the leaves of the Red cedar being substituted for those of the Savin. When properly prepared by boiling the fresh leaves for a short time in about twice their weight of lard with the addition of a little wax, a cerate is formed of peculiar efficacy as a perpetual epispastic. When applied as a dressing to a newly vesicated surface, and afterwards repeated twice a day, it rarely fails to keep up the discharge for an indefinite length of time. Under its operation, the discharge usually changes from a serous to a puriform appearance, and concretes upon the surface; so that it requires to be removed from time to time, to admit the full action of the cerate.

Internally the leaves of the Juniperus Virginiana have been found to exert effects very similar to those of the Savin. They have proved useful as an emmenagogue, and as a general stimulant and diaphoretic in rheumatism. They have also had some reputation as a diuretic in dropsy.

The wood of the Red cedar is smooth, light, and very durable. Its alburnum is white, but the heart wood of a beautiful red colour, whence its name is derived. It is principally employed for posts in fences, in which capacity it proves

more durable than almost any species of wood used for the same purpose.

## BOTANICAL REFERENCES.

Juniperus Virginiana, Willd. iv. 862.—Pursh, ii. 647.—Michaux, *fil. N. A. Sylva, t.* 155.

## MEDICAL REFERENCE.

Thacher, *Disp.* 247.

## PLATE XLV.

Fig. 1. *Juniperus Virginiana in fruit,*
Fig. 2. *Variety with long leaves.*
Fig. 3. *Barren branch in flower.*
Fig. 4. *Barren ament magnified.*
Fig. 5. *Scale and anthers.*

*Menyanthes trifoliata*

# MENYANTHES TRIFOLIATA.

## *Buck Bean.*

=

### *PLATE XLVI.*

THE *Buck bean* or *Marsh Trefoil* is one of those plants which are native in Europe and North America, with so little difference of structure, in the two continents, that their specific identity can hardly be doubted. I have compared specimens of the native, and foreign plant, without being able to perceive the least definable difference, except in size; the American being smaller. Yet, if we admit the statements of botanical writers, the plant flowers in England at least a month later than it does in the neighbourhood of Boston, a circumstance not usual in other species of vegetables.

The most spongy and boggy soils, which are inundated at certain seasons, and never wholly destitute of water, are the favorite situations of the Menyanthes trifoliata. It often constitutes large

beds at the margin of ponds and brooks. It is common in New England, and grows, according to Pursh, as far south as Virginia.

The genus *Menyanthes* has its *corolla hairy on the upper side; stigma bifid; capsule one celled, two valved.* The species in the present article is named from its *ternate leaves.* Class *Pentandria.* Order *Monogynia.* Natural orders *Rotaceæ*, Lin. *Gentianæ*, Juss.

The root of this plant penetrates horizontally in the bog-earth to a great distance. It is regularly intersected with joints at the distance of about half an inch from each other, these joints being formed by the breaking off of the old petioles and their sheaths. The leaves proceed from the end of the root on long stalks furnished with broad sheathing stipules at base. They are trifoliate, nearly oval, glabrous, somewhat fleshy, and slightly repand, or furnished with many irregularities at the edge, which hardly prevent them from being entire. The scape is round, ascending and smooth, bearing a conical raceme of flowers. Peduncles straight, scattered, supported by ovate concave bractes. Calyx erect, subcampanulate, five parted, persistent. Corolla funnel shaped, the tube short, the border five cleft, spreading and at length revolute, clothed on

the upper part with a coating of dense, fleshy, obtuse fibres. The colour, in the American variety, is generally white, with a tinge of red, particularly on the outside. Stamens five, shorter than the corolla, and alternate with its segments; the anthers oblong-arrow shaped. Germ ovate; style cylindrical, persistent, as long as the corolla; stigma bifid, compressed. Capsule ovate, two valved, one celled. Seeds numerous, minute, attached to two lateral receptacles.

In New England this plant flowers about the middle of May.

The whole plant and particularly the root has an intensely bitter taste, hardly exceeded by that of Gentian and Columbo. This bitterness resides chiefly in an extractive matter, soluble in water and spirit. The root is, however, resinous and impregnates alcohol more strongly than water, and may be precipitated from its tincture, in part, by the latter fluid.

The root of this vegetable is undoubtedly entitled to a high place in the list of tonics. In Europe it has long been admitted to a place in the Materia Medica, and has received the commendations of various physicians. When given in small doses, about ten grains, it imparts vigour to the stomach and strengthens digestion. Its

tincture, moderately used, has the same effect. Large doses, such as a drachm of the powdered root, or two or three gills of the saturated decoction, produce vomiting and purging, and frequently powerful diaphoresis. In this respect it agrees with many vegetable bitters, and perhaps resembles most nearly the Eupatorium perfoliatum. Its bulk, however, and unpleasant taste render it inconvenient to be used as an evacuant.

We are told by authors that the Buck bean has been employed with benefit in intermittent and remittent fevers. Boerhaave, in his own case of gout, was relieved by drinking the juice of the plant mixed with whey. Other physicians have found it useful in keeping off the paroxysms of that complaint. Dr. Cullen informs us, that he has "had several instances of its good effects in some cutaneous diseases of the herpetic or seemingly cancerous kind. It was taken by infusion in the manner of tea." Others have commended this vegetable in rheumatism, dropsy, scurvy and worms. Its reputation in the North of Europe, particularly in Germany, was at one time so high, that it was consumed in large quantities, and deemed a sort of panacea. Its true character, however, is simply that of a powerful bitter tonic, like Gentian and Centaury, to which it is closely

related in its botanical habit, as well as sensible properties.

We may regard this plant as one of the numerous vegetable bitters abounding in our country, which are fully equal in strength to imported articles of their class, and which may hereafter lessen our dependance on foreign drugs.

Linnæus, in his Flora Lapponica, informs us, that in times of scarcity, sheep will subsist upon this plant, notwithstanding its bitterness. The Laplanders employ it as a substitute for hops to prevent acescency in their beer. They even introduce it in some instances into their bread, upon which Linnæus bestows the epithet, "amarus et detestabilis."

## BOTANICAL REFERENCES.

Menyanthes trifoliata, Linn. *Sp. pl.*—Œder. *Flora Dan. t.* 541.—Curtis, *Flor. Lond.* 4. *t.* 17.—Woodville, *Med. Bot. t.* 2.—Smith, *Engl. Bot. t.* 495.—Michaux, *Flora.* i. 125.—Pursh, i. 139.—Menyanthes palustre triphyllum, Ray. *Syn.* 285.—Trifolium paludosum, Gerard. *em.* 1194.

## MEDICAL REFERENCES.

Murray, *Apparatus med.* ii. 33.—Linnæus, *Fl. Lap.* 50.—Haller, *Hist. Stirp. Helv.* 633.—Cullen, *Mat. Med.* ii. 53.—Thompson, *Lond. Disp.* 256.

## PLATE XLVI.

Fig. 1. *Menyanthes trifoliata.*
Fig. 2. *Calyx.*
Fig. 3. *Petal.*
Fig. 4. *Stamen.*
Fig. 5. *Style.*
Fig. 6. *Fruit.*

*Ranunculus bulbosus*

# RANUNCULUS BULBOSUS.

## *Bulbous Crowfoot.*

=

### *PLATE XLVII.*

It is a remarkable fact that a great portion of the *weeds*, which are most troublesome in the United States, are of European origin, having introduced themselves since the discovery of this country. Some of these emigrants have settled in our grazing and mowing lands, such as the Ranunculus bulbosus, acris and repens, indiscriminately called *Buttercups*, *Crowfoot*, and *Yellow weed;* the Chrysanthemum leucanthemum, or *White weed;* the Rumex acetosella, or *Sorrel;* the Hypericum perforatum, or *St. John's wort*, &c. In our cornfields and gardens are quartered the *Couch grass*, Triticum repens; the different species of *Goosefoot* or *Pig weed*, Chenopodium; the *Dock*, Rumex crispus, &c.; the *Charlock* or *Wild Radish*, Raphanus Raphanistrum; *Burdock*, Arctium lappa, &c. Some have

commenced their inroads within a few years, such as the Cnicus arvensis, improperly called *Canada thistle*; the Genista tinctoria or *Dyer's weed*, &c. —In return for these introductions, we have sent them the Erigeron Canadense, and the prolific families of Ambrosia and Amaranthus.

No race of plants is more familiarly known than the Ranunculi. Of numerous species, both native and imported, which we possess; several resemble each other so nearly, as to pass with common observers for the same plant. The great similarity of their properties renders it almost unnecessary in a medical or economical point of view to distinguish them. I have selected the bulbous-rooted species, not because it is more active in its properties than many others, but because it is one of the most common and best known.

The genus belongs to the class *Polyandria*, and order *Polygynia*. It is found in the natural orders *Multisiliquæ*, Linn. and *Ranunculaceæ*, Juss. Its generic character is formed by *a five leaved calyx; five petals, with a melliferous pore at the base of each; the seeds naked.* No genus can be more strictly natural than this. A general resemblance pervades the whole of the species, which indicates their consanguinity at sight.

The nectary, the never failing concomitant of this genus, is a small cavity at the inside of the claw of each petal, generally covered by a flat scale, sometimes surrounded with a concave brim, and at others inclosed in a short cylinder. A subtle and violent acrimony, on which the medical properties seem to depend, is found in most, if not in all, of the species.

The species *bulbosus* has *compound leaves, an erect many flowered stem, a furrowed peduncle, reflexed calyx, and bulbous root.* It grows generally in dry pastures, mowing lands and road sides, flowering abundantly in May and the first part of June, after which it gives place to its equally abundant successors, R. acris and repens, which, however, generally prefer a more moist soil. These three species, having flowers of similar size and appearance, are indiscriminately known by the name of *Buttercups.* Their distinction affords a pleasing instance of different combinations of features, forming separate characters for similar plants. The *R. bulbosus* has a furrowed flower-stalk and reflexed calyx; *R. repens* a furrowed flower-stalk and spreading calyx, and *R. acris* a round flower-stalk and spreading calyx.

A more particular description of the plant in our figure is as follows. Root fleshy, solid, roundish, depressed, sending out radicles from its under side. In autumn it gives off lateral bulbs near its top, which afford plants for the next year, while the old root decays. Stems several, erect, round, hairy, branching. Root leaves on long petioles, ternate, sometimes quinate; the segments variously cut, lobed and toothed; hairy. Stem leaves sessile, ternate, the upper ones more simple. Flowers several on a stem, solitary, of a bright glossy yellow. Peduncles furrowed, angular, hairy. Calyx leaves oblong, hairy, bent back against the peduncle. Petals five, inversely heart shaped; the nectary at the claw covered with a small wedge-shaped emarginate scale. Stamens numerous, yellow, with oblong erect anthers. Germs numerous with reflexed stigmas. Fruit a spherical head composed of acute, naked, diverging seeds with recurved points.

The roots of Ranunculus bulbosus appear to consist principally of albumen intermixed with ligneous fibres. If the root be macerated in cold water, it gives a solution of this substance, which coagulates in flocks on the application of heat; and undergoes the same process slowly on the

admixture of alcohol. But the most interesting constituent in this, and in most other species, is the acrid principle which pervades every part of the plant in its green state. Like the acrimony of the Arum, it is volatile, and disappears in drying, or upon the application of heat. It differs, however, in not being destroyed by a moderate heat, and in being fully preserved in distillation. I have subjected various species of Ranunculus to this experiment, and always found the distilled water to possess a strong acrimony; while the decoction and portions of the plant remaining in the retort were wholly destitute of this property. This distilled water, when first taken into the mouth, excited no particular effect; but after a few seconds a sharp, stinging sensation was always produced. When swallowed, a great sense of heat took place in the stomach. I preserved some of the water distilled from leaves of Ranunculus repens, for several months in a close stopped phial; during which time it retained its acrimony undiminished. In winter time it froze, and on thawing had lost this property. Tilebein, as quoted by Dr. Pulteney, in some experiments on this genus of plants, found that water distilled from *R. sceleratus*, on cooling, deposited small crystals, which were hardly soluble in any men-

struum, and were of an inflammable nature. I have not met with an appearance of this kind. The distilled water, however, had a substance dissolved in sufficient quantity to yield a gradual precipitate with some reagents, such as muriate of tin and acetate of lead. The strength of the distilled water is impaired by continuing the operation too long. The acrimony of the plant is expended in a very short time at the boiling heat, and a farther continuance of the distillation brings over only water.

Since the time of Dioscorides [*Note* A.] the acrid and stimulating properties of the Ranunculi have been well known. This acrimony resides in all the species, with the exception of *R. auricomus*, which is said to be mild, and perhaps two or three others. It is so powerful that it speedily inflames or corrodes the lips and tongue, if kept in contact with them. In the nostrils it acts as a violent sternutatory, and if swallowed in considerable quantity, it brings on great pain, heat and inflammation of the stomach, and has even occasioned convulsions and death.

Before the introduction of Cantharides as a vesicatory, different species of Ranunculus were used upon the skin, as external stimulants. Their power of occasioning erosion and ulceration

appears to have been known to the ancients. Different medical writers have given accounts of their mode of operation; but the most extensive history and investigation is that of Krapf, published at Vienna, in 1766. This work, which I have not seen, is quoted in all its principal facts by Professor Murray of Göttingen in the Apparatus medicaminum. According to this author the various species, with which his experiments were made, proved capable of exciting inflammation, blistering and ulceration, when applied to the skin. A slice of the fresh root of R. bulbosus placed in contact with the inside of the finger, brought on a sense of burning in two minutes. When taken off, the skin was found without redness, and the sense of heat and itching ceased. In two hours, however, it returned again, and in ten hours a full serous blister was raised. This was followed by an ulcer of bad character and difficult to heal. He remarks that, if the application is continued after the first itching, the pain and subsequent erosion is much greater.

From the accounts given of this species, also of R. sceleratus, R. acris, and some others, it appears that the leaves, flowers, buds, or roots of these plants, if bruised and applied to the skin, excite redness and vesication. This effect is not

constant, but fails to take place in certain constitutions or at certain seasons of the year. Generally, however, they are said to operate in half an hour, or less, from the time of their application. They are stated to possess the advantage over blisters made by flies, that they never occasion symptoms of strangury.

With a view to their external stimulus they have been used advantageously in rheumatism, the hip disease, hemicrania, and fixed pains of various descriptions. Among the old practitioners, who have recorded instances of their effects, are Baglivi, Storck, and Sennertius. A curious practice, at one time, prevailed in several countries in Europe, of applying the Ranunculus to the wrists or fingers, for the cure of intermittent fever. This is mentioned by Van Swieten, Tissot, and some others. In hemicrania it was applied to the head, and in this case it did not produce a discharge, nor break the skin; but occasioned tumefaction of the hairy scalp.

An objection against the use of the Ranunculi, as external stimulants, exists in the uncertainty of their operation, and the violent effects which sometimes have followed after they had been applied. Those writers, who have witnessed their application, record instances in which these vege-

table blisters have been followed by deep, ill-conditioned and sloughing ulcers, which were not healed without great difficulty. Tissot mentions an instance, in which an application made to the thumb caused a deep, painful ulcer, which penetrated to the bone, and occupied some months in its cure. In another case the blister spread, in a few hours, over the whole arm, occasioning fever and delirium, and was followed by such a tendency to gangrene, that the limb was with difficulty saved. Chesnau, quoted by Murray, advises that the Ranunculus should be applied to a small surface only, and through a perforation in an adhesive plaister, to prevent it from spreading. From want of this caution, he had known extensive inflammation to arise and spread over a greater part of the face, neck, and breast.—Linnæus, in his Flora Suecica, relates that beggars, in Sweden, were known to excite ulcerations of their feet with the Ranunculus sceleratus, to assist them in extorting charity from passengers.

I know not to what extent the efficacy of the Ranunculi, externally applied, can be depended on. Certain it is that they do not affect all persons alike, and this fact is avowed by those who have used them most. I have repeatedly made applications of the contused roots and

leaves of different species to my arm and hand, and worn them for a dozen hours, without feeling any particular sensation, or perceiving any visible effect. The rapid drying up of the moisture of the plant seemed to prevent it from acting upon the skin. I am inclined to believe, there is something in the action of these vegetables analogous to that of the poisonous species of Rhus described in this work; which some individuals, but not all, are susceptible of. The extensive and spreading inflammation, which they occasionally produce, resembles more the effect of these shrubs, than of any of the ordinary rubefacients or vesicants.

The burning sensation which the Ranunculi excite in the mouth when chewed, extends to the stomach if they are swallowed. Krapf states that a small portion of a leaf or flower of R. sceleratus, or two drops of the juice, excited acute pain in the stomach, and a sense of inflammation in the throat. He gave a large quantity of the juice to a dog, which brought on vomiting and great distress; and the animal being killed, was found with the stomach inflamed and contracted, and the pylorus hardly pervious. The same author informs us that dilution greatly diminishes the power of this fluid, so that half a

drachm of the juice, in six ounces of water, may be taken with entire safety.

Dr. Withering, as quoted by Dr. Pulteney in the Linnæan transactions, asserts, that the distilled water of Ranunculus flammula is an emetic more instantaneous and less offensive than sulphate of zinc. I know not in what publication of Dr. W. this statement is made, but the fact appears to me not improbable. Acrid substances, such as mustard, pepper, and horse-radish, if swallowed in large quantities, excite the stomach to relieve itself by vomiting. An objection, however, exists against the distilled water, owing to the uncertainty of its strength; which must vary in proportion to the quantity of the plant employed, the time occupied in distillation, and the subsequent time for which the fluid is kept.

Krapf states that R. auricomus and R. lanuginosus are so free from acrimony, that they are eaten as greens or sallads. All the species lose their pungency in boiling, so that even the R. sceleratus, one of the most acrid, is used for the same purpose.

Grazing cattle generally avoid the plants of this genus, which grow among grass, as far as it is possible for them to do it. Accordingly we observe the flowers of Ranunculi left untouched,

while the grass is closely cropped around them. It is nevertheless unavoidable, so common are these plants, that portions of them should be eaten very often by these animals. It is probable that small quantities of the less acrid sorts do them no injury. At least, it appears that their stomachs are much less susceptible to this kind of stimulus than ours. In the *Pan Suecus* some experiments upon these plants, with domestic animals, are detailed; in which, it is stated that, horned cattle refused to eat all the species when offered to them, except R. auricomus. This species was rejected by horses, while they would eat R. flammula. Sheep and goats eat the R. acris, one of the most pungent species. Dr. Pulteney states, as a well known fact, that hogs, in England, devour the roots of R. bulbosus. How it is that these animals resist the deleterious effects of so virulent plants, it is not easy to say. It is, however, a not more remarkable fact, than the power of some animals to devour Cantharides and even mineral poisons with impunity.*

In their dry state, various species of Ranunculus enter into the composition of hay, particularly R. acris. Having lost their acrimony altogether in drying, they are harmless and probably nutritive.

* See a note, vol. i. p. 164.

Dr. Pulteney has published a memoir in the Linnæan transactions on the economical use of some of the Ranunculi, particularly the R. fluviatilis, which he considers a variety of R. aquatilis. Contrary to the common effects of the other species, this plant is said, by him, to be not only innocent, but highly nutritive to cattle. He states that, "in the neighbourhood of Ringwood, on the borders of the Avon, which affords this vegetable in great abundance all the year, some of the cottagers sustain their cows, and even horses, almost wholly upon this plant; since the remaining part of their food is nothing more than a scanty pittance, they get on the adjacent heath, which affords little more than Ling, Lichen, Bog-moss or Sphagnum, &c. It is usual to employ a man to collect a quantity for the day every morning, and bring it in the boat to the edge of the water, from which the cows, in the instance seen, stood eating it with great avidity. I was indeed informed," says he, "they relished it so highly, that it was unsafe to allow them more than a certain quantity; I think between twenty five and thirty pounds daily, each; but with variation according to circumstances. The cows I saw were apparently not in a mean condition, and gave a sufficient quantity of good milk. I

was told by the person whose cattle were feeding on it, that he kept five cows and one horse so entirely on this plant and what the heath afforded, that they had not consumed half a ton of hay throughout the whole year; none being used except when the river was frozen over. I examined the whole parcel on which four cows were feeding, in the beginning March, and found the whole consisted exclusively of the Ranunculus fluviatilis without any mixture of the Potamogeton, Carex, Sparganium, or other aquatic plants. In summer, however, it can hardly be avoided but that there must be a mixture of some of these, but other plants are not chosen.

"This account was confirmed to me by different persons; by whom I was further informed that hogs are also fed with the same plant, on which they improve so well, that it is not necessary to allow them other sustenance, till it is proper to put them up to fatten."

In Veterinary practice the Ranunculus bulbosus has been employed as an external stimulant. To this purpose Dr. Chapman, in his Therapeutics, thinks it may be better adapted than other topical excitants.

## BOTANICAL REFERENCES.

Ranunculus bulbosus, LINN. *Sp. pl.*—CURTIS, *Flora Lond.* i. 38.—MARTYN, *Flora rustica, t.* 28.—SMITH, *Flora Britt.* 591.—*Engl. Bot. t.* 515.—MICHAUX, i. 321.—PURSH, ii. 393.—Ranunculus tuberosus magor, J. BAUHIN, iii. 417.—Ranunculus pratensis, &c.—ŒDER, *Fl. Dan. t.* 515.

## MEDICAL REFERENCES.

MURRAY, *Apparatus, Med.* iii. 88.—KRAPF. *Ranunculi. Vienna,* 1766.—LEWIS, *Mat. Med.* ii. 262.—B. S. BARTON, 23.—PULTENEY, *Lin. transactions,* v. 14.—CHAPMAN, *Therapeutics,* ii. 411.

## PLATE XLVII.

Fig. 1. *Ranunculus bulbosus, the radical leaf of the largest size and more subdivided than common.*

Fig. 2. *Radical leaf of smaller size and more common shape.*

Fig. 3. *Petal and nectary.*

Fig. 4. *Two stamens enlarged.*

Fig. 5. *Fruit.*

# ILLICIUM FLORIDANUM.

## *Starry Anise.*

=

### *PLATE XLVIII.*

THE same qualities which entitle the Liriodendron and Magnolias to a place among medicinal plants, exist abundantly in the kindred genus of Illicium. This family consists of fine, spicy, flowering shrubs, one of which, the I. anisatum, growing in Eastern Asia, derives its name from the similiarity of its flavour to that of Anise, a quality which exists, though less simple, in the subject of the present article. Another species, the I. parviflorum, a shrub with small yellowish flowers, first discovered by Michaux in the mountains of Georgia and Carolina, has so exactly the flavour of the Sassafras root, that they are not to be distinguished by the taste. The I. Floridanum forms beautiful thickets in the country bordering on the north of the Gulf of

PL. XLVIII.

Mexico, and is often mentioned by the traveller Bartram, with his accustomed enthusiasm, as one of the chief beauties of that exuberant region. In the Northern states, as well as in Europe, it is preserved by artificial heat. The drawing, which illustrates our description, was made from a greenhouse specimen.

The character assigned to this genus is formed by *a six leaved calyx, twenty seven petals, and a number of capsules arranged in a circle, two valved, one seeded.* The species *Floridanum* has its *leaves acuminate and its petals numerous, oblong and linear.*

The class and order are *Polyandria, Polygynia;* and the Natural orders *Coadunatæ*, Linn. *Magnoliæ*, Juss.

The Illicium Floridanum is a shrub, in some instances entitled to be considered a small tree. Its leaves are scattered, or grow in tufts, on short petioles. They are evergreen, oval lanceolate, slightly acuminate, entire, smooth on both sides, and firm or fleshy. The flower buds proceed from the sides of the branches at the axils of the last year's leaves. The flowers grow on slender, nodding peduncles, an inch or two long. When fully expanded, they are about the size of a dollar, and of a dark, purplish crimson. Calyx deci-

duous. Petals linear, obtuse, in three rows, about nine in a row, the uppermost row ascending, the lowermost descending, and broader or more spatulate. Stamens thirty or more, diverging, flat, depressed with the anthers recurved; pollen white. Germs a dozen or more, roundish-rhomboidal, compressed and arranged in a circular manner; styles short, recurved, pubescent on the inside. The fruit, which I have not seen, is represented by authors, as has been stated in the generic character.

The leaves and young shoots of this species of Starry anise abound in a fine, clear mucilage, which becomes immediately perceptible in the mouth, if these parts are chewed, and which communicates to water in a short time a ropy consistence. This mucilage is separated from the decoction by alcohol in the form of dark brown, tough, stringy coagula. Muriate of tin causes a precipitate after these coagula are withdrawn, which seems to indicate the presence of extract. Sulphate of iron added to the decoction, coagulated the mucus and darkened the colour. I discovered no traces of resin in the portions submitted to experiment, and a strong tincture was not disturbed by water. The trial, however, was conducted on a small scale.

The bark and leaves of the Illicium Floridanum are strongly impregnated with a spicy, aromatic taste and smell, approaching that of the Magnolias and Liriodendron, but perhaps more similar to that of some of the pungent seeds, particularly Anise and Coriander, between which they seem intermediate. This aroma is preserved in the distilled water, and fills the room with its fragrance, while distillation is going on. I was not able in my limited experiments to separate any volatile oil or camphor, on one of which principles, as in similar cases, the aroma doubtless depends.

An account of this species of Illicium is given, with a figure, in the Philosophical transactions for 1770, by John Ellis, Esq. He says, "We are indebted for the discovery of this curious American tree to a servant of William Clifton, Esq. of West Florida, who was sent to collect specimens of all the rarer plants by his master; and in April 1765, he met with it growing in a swamp near Pensacola. After this, in the latter end of January 1766, Mr. John Bartram, the king's botanist for the Floridas, discovered it on the banks of the river St. John, in East Florida, as appears from his description of it, and a drawing of a seed-vessel with some of the leaves, sent

to Mr. Collinson." Mr. Bartram's description of it, as it appears in his journal up the river St. John, published by Dr. Stork, in his account of East Florida, is as follows. "Near here my son found a lovely, sweet tree, with leaves like the sweet bay, which smelled like Sassafras, and produces a strange kind of seed-pop; but all the seed was shed. The severe frost had not hurt it;—some of them grow nearly twenty feet high, a charming bright evergreen aromatic."*

Of the medicinal properties of this shrub, I am unable to speak with the certainty, which might have attended an extensive number of trials, made with the bark of full grown specimens. From the evidence afforded by the bark and leaves of a greenhouse specimen, and by the analogy of other species, and similar trees, I should not feel much hesitation in attributing to the Illicium the properties of a tonic-stimulant and diaphoretic. I have at least satisfied myself that the bark of a twig, and three or four of the leaves, produce no unpleasant consequence. Its bitter taste and aromatic quality point out its analogy to Cascarilla, Canella, Sassafras, and other aromatic barks, which are regularly consumed in the shops. Its

* It is very possible the above description may have been intended for Illicium parviflorum.

co-species, the Illicium anisatum of the East, is used as a condiment to communicate an agreeable flavour to certain dishes. The Chinese chew it after dinner as a stomachic and a sweetener of the breath. In some parts of the East Indies the natives and Dutch mix it with their tea and sherbet. It is also burnt as incense before their idols by some of the oriental nations, and carefully kept as an antidote to various poisons.

The beauty of both these shrubs renders them desirable acquisitions to collectors of plants.

## BOTANICAL REFERENCES.

Illicium Floridanum, Linn.—Curtis, *Bot. Mag. t.* 439.—Michaux, i. 526—Pursh, ii. 380.

## MEDICAL REFERENCES.

Ellis, *in Philosophical transactions abridged*, xiii. 87. *t.* 2.—Schœff, 91.

## PLATE XLVIII.

Fig. 1. *Illicium Floridanum.*

Fig. 2. *Several stamens magnified.*

Fig. 3. *Pistils magnified.*

Fig. 4. *A pistil separate.*

# ARISTOLOCHIA SERPENTARIA.

## *Virginia Snakeroot.*

=

## *PLATE XLIX.**

It is probable that this root, like many other articles now used in medicine, was indebted to its sensible qualities, for its first introduction into use. As the name implies, its earliest medicinal character was founded on a supposed antidotal power against the bite of venomous serpents. Cornutus, at the end of his book on the plants of Canada, published at Paris in 1635, tells us, that a root had been sent to him from "*Notha Anglia*," which was called *Serpentaria*, and in the vernacular tongue *Snagröel*. This root was a very sure safeguard against the bite of a huge serpent in that country, which proved inevitably fatal within twelve hours, unless a good portion of the antidote

* I am indebted to a gentleman in Georgia for the very natural drawing of this plant.

PL. XLIX

Aristolochia Serpentaria

was swallowed in season; which being done, no one was ever known to be in danger of his life from this cause.

The snagröel has had a great many rivals in the character of specifics against the bite of serpents. So great, indeed, is the number of articles which are called uniformly successful in such cases, that we are compelled to believe, that the bite of the rattle snake, and doubtless of other venomous serpents in the country, although attended with severe and alarming consequences, is nevertheless but seldom fatal; and hence that the honor of proving specific in these cases is one of cheap acquisition.

The Serpentaria grows in woods in the Southern and Middle parts of the United States. It bears cultivation in any part of the union, thongh the most northerly situation, from which I have received wild specimens, is the vicinity of New Haven, from which place some living plants were sent to me by Dr. Monson.

The genus *Aristolochia* has *a monopetalous, tubular, crooked corolla, swelling at base, and dilated at the border. Capsule inferior, six celled.* The species *Serpentaria* has its *leaves heart-shaped, oblong, acuminate; stem flexuous; peduncles radical.* Pursh mentions a variety with

leaves so narrow, as to appear like a distinct species; the flower, however, being not different. Woodville's figure of our plant has the leaves much too broad for the common habit of the vegetable.

It belongs to the class *Gynandria*, order *Hexandria*, or more properly *Dodecandria*. It is one of the few genera placed by Linnæus in that class which are not of the Orchideous tribe. Natural orders *Sarmentaceæ*, Linn. *Aristolochiæ*, Juss.

This vegetable is humble in its growth, being most commonly under a foot in height. The root is extremely fibrous, and sends up a number of stems. These are simple or slightly branched, jointed, flexuous, and often of a reddish tinge. The leaves are alternate, on short petioles, oblong, entire, acuminate, heart-shaped at base and three nerved.

The flowers grow close to the ground, like those of Asarum. They have a stiff leathery texture, and a dull brownish purple colour. The peduncle which supports them has one or more leafets, and gradually enlarges into a furrowed obovate germ. The corolla, like others in this singular genus, consists of a long contorted tube, bent in the form of the letter S, swelling at its

two extremities, having its throat surrounded by an elevated edge or brim, and its border expanded into a broad irregular margin, forming an upper and under lip, which are closed in a triangular manner in the bud. The anthers are twelve in number, growing in pairs to the sides of the fleshy style, which is situated in the bottom of the corolla, and covered by a firm, spreading convoluted stigma, which extends over the anthers. The capsule is obovate, six angled, six celled, with numerous small flat seeds.

Snakeroot has a penetrating, rather agreeable, resinous smell, and a pungent bitter taste, resembling somewhat that of the Pinus Canadensis, or Hemlock spruce. It communicates its qualities both to spirit and water, but most to the former. I subjected a quantity of the root to distillation for one hour, and obtained in the receiver a whitish pearly fluid, very strongly impregnated with the aroma, but less bitter than the root. On standing twenty four hours, this fluid deposited round the edges of the surface a considerable number of small white crystals, which proved to be pure camphor. They were inflammable, fusible with a sudden, and volatile with a gradual heat. I perceived no essential oil, though Dr. Lewis informs us. that if the

quantity of root, submitted to the operation, be large, there arises a small portion of pale coloured essential oil of a considerable smell but of no very strong taste. There is probably a portion of resin present, as I found that the root, after having been boiled in water an hour, still impregnated alcohol so as to cause a precipitate with water. The bitterness communicated to the infusion and decoction appears to reside in a variety of extractive matter.

Medicinally considered, Serpentaria is a tonic, diaphoretic, and in certain cases an antispasmodic and anodyne. It has been abundantly used in fevers of various descriptions, and has been commended by a host of medical writers. There is no doubt that it has been injudiciously employed in many cases, in fever attended with an active pulse and inflammatory diathesis. The early stages, also, of febrile diseases rarely admit the exhibition of so decided a stimulant, without injury. But in the advanced stages of fever and those attended with typhoidal symptoms, this medicine is resorted to with great advantage, both alone and in combinaton with other tonics and stimulants. It is peculiarly useful in supporting the strength, and in allaying the irregular actions which attend great febrile debility, such as

subsultus tendinum, delirium, watchfulness, &c. Its bitter ingredients, and the camphor which it contains, no doubt contribute to these effects. It is most advantageously given in combination with bark, or with wine and opium.

Snakeroot is a popular remedy in exanthematous disorders as a diaphoretic, being given to keep out the eruption, and to restore it when it has receded. In the latter case its use is doubtless injudicious, and if it fails to reproduce the eruption, it greatly increases the heat, pain, and restlessness of the patient. It is better in cases where the eruption has receded to the disadvantage of the patient, to attempt its restoration by nauseating and saline diaphoretics, and even by a full emetic, than to incur the risk of aggravating the symptoms by a stimulating regimen.

Dr. Chapman, in his Therapeutics, considers the Serpentaria as partaking the mixed qualities of a stimulant and tonic, and acting also as a diaphoretic and diuretic. It is peculiarly useful as an auxiliary to the bark. He states, that one of the more early uses of the medicine was in the cure of intermittent fever. Whether alone it was found adequate to this purpose, does not clearly appear. "It was used by Sydenham in conjunction with wine, to prevent the recurrence of

the paroxysm, and from his account, not without advantage. As a general rule, he says, that in all cases, where it is expedient to combine wine with bark, the effect will be much increased by adding Serpentaria. The correctness of this observation has been fully confirmed by subsequent experience, and it is now very much the practice to unite the two articles in the low states of disease."

Dr. Chapman farther states, that though it is doubtful whether the Serpentaria, by itself, will cure ague and fever, it is certainly a powerful assistant to bark, not only in increasing its efficacy, but, what is of great consequence, in enabling the stomach to retain the medicine.

To remittent fever he thinks this medicine better adapted. It has here, in many cases, an indisputable superiority over bark, inasmuch as it is rarely offensive to the stomach, and may be given without injury, in those obscure states of the disease, where the remission is not readily discernible. He prefers, in these cases, a combination of bark, snakeroot, and soda.

Snakeroot, he informs us, is much resorted to as a popular remedy in the management of the secondary stages of pleurisy. After bleeding, it is the ordinary practice, in many parts of our

country, to resort to a strong infusion of this article with a view of exciting perspiration. Catarrhs, rheumatisms, and other winter complaints, incident to rustic life, are managed in the same way. In that species of pleurisy which is properly enough designated by the epithet bilious, he has repeatedly had occasion to recur to the Serpentaria, and always with more or less utility. This bilious pleurisy he considers as having all the characters of pneumonic inflammation, with the addition of some of the symptoms incident to autumnal fever, such as headach, great gastric distress, and almost always violent vomitings of bile. It differs also from ordinary pleurisy in having less activity of inflammation, and consequently in not bearing the same extent of depletion. The system, indeed, will often be very evidently depressed by one or two bleedings. In this case the practice which has been commonly pursued is, after the removal of a comparatively small portion of blood, and the thorough evacuation of the alimentary canal; to administer very freely draughts of the infusion of the Serpentaria in order to excite copious diaphoresis.

Dr. Chapman concludes his remarks on this article, by stating, that it is admirably suited to check vomitings, and to tranquillize the stomach,

more particularly in bilious cases. It is given for this purpose in decoction, in the small dose of half an ounce or less at a time, and frequently repeated.

The most common form of exhibiting snakeroot is in infusion, for which purpose half an ounce may be steeped in a pint of boiling water for two hours, in a covered vessel. Of this infusion an ounce or two may be taken every three or four hours. Decoction is a less proper mode of preparing this plant, as it tends to dissipate the volatile parts, a portion of which is detained in a state of mixture by the infusion. Sometimes the powder is given in doses of from ten to thirty grains. A tincture of snakeroot is made by digesting an ounce of the root in a pound or somewhat less of proof spirit. The compound tincture of bark, commonly called Huxham's tincture, contains Serpentaria as one of its ingredients.

## BOTANICAL REFERENCES.

Aristolochia serpentaria, LINN. *Sp. pl.*—WALTER, *Flor. Car.* 223.—WOODVILLE, ii. 291. *t.* 106.—MICHAUX, ii. 162.—PURSH, ii. 596.—Pistolochia sive Serpentaria Virginiana, &c.—PLUKENET, *t.* 148. *f.* 5.—CATESBY, *Car.* i. 29.

## MEDICAL REFERENCES.

MURRAY, *App. Med.* i. 348.—CULLEN, *Mat. Med.* ii. 85.—CHAPMAN, *Therapeutics*, ii. 411.—LIND. *Hot climates*, 104, 254.

## PLATE XLIX.

Fig. 1. *Aristolochia serpentaria with the flower beginning to expand.*

Fig. 2. *Side view of the flower expanded.*

Fig. 3. *Front of ditto.*

Fig. 4. *Longitudinal section of the flower.*

Fig. 5. *Style, anthers, and stigma magnified.*

Fig. 6. *Fruit.*

# ALETRIS FARINOSA.

## *Star Grass.*

PLATE L.

I know of no plant which surpasses the Alteris farinosa in genuine, intense and permanent bitterness. Neither aloes, gentian, nor quassia exceed it in the impression produced on the tongue. It has, on account of this property, attracted the observation of some medical men, and may hereafter become an article of more consequence in the Materia Medica. Although the number of trials, hitherto made, are perhaps not sufficient to fix with precision its exact character, yet in a collection of American medicinal vegetables it ought not to pass unnoticed.

This plant grows in most parts of the United States in fields and about the edges of woods, and flowers in June and July. I have found it near Boston on the south, but never to the north of it.

1

2

3

4

*Helonias foetidissima*

Its mode of growth is not without beauty, the leaves spreading close to the ground in a radiated manner, like a star; while the spike is supported by an almost naked stalk, at a distance above them. The names *Star Grass* and *Blazing star* are generally given to it in the country, from the peculiar appearance of its leaves.

The genus Aletris has its *corolla tubular, six cleft, wrinkled, persistent; stamens inserted into the base of the segments; style triangular, separable into three; capsule opening at top, three celled, many seeded.* The species *farinosa*, called *alba* by Michaux and Pursh, has its *flowers pedicelled, oblong-tubular, somewhat wrinkled in fruit; the leaves broad lanceolate.* Michaux observes that of the species referred by Linnæus to this genus, the A. farinosa is the only one which strictly belongs to it. Class *Hexandria;* order *Monogynia;* natural orders *Liliaceæ*, Linn. *Asphodeli*, Juss.

This plant has a single circle of radical leaves, which are sessile, nerved, lanceolate, and smooth. The stem or scape is from one to three feet high, invested with remote scales, which sometimes expand into small leaves. The flowers form a slender, scattered spike with very short pedicels and minute bractes. Calyx none. Corolla white,

of an oblong bell-shape, divided at the mouth into six acute, spreading segments. The outside, particularly as the flower grows old, has a roughish, wrinkled or mealy appearance, by which the specific name was suggested. The stamens are short, inserted near the mouth of the corolla at the base of the segments. The circumstance of their being opposite to the segments, and not alternate with them, affords the most distinguishing mark of this genus. The anthers are somewhat heart-shaped. Germ pyramidal, half inferior, tapering: style triangular, separable into three. Capsule invested with the permanent corolla, triangular, three celled, three valved at top. Seeds numerous, minute, fixed to a central receptacle.

The *Aletris aurea*, of Michaux and Pursh, closely resembles this species, and it is difficult, by comparing specimens of the two, to point out any permanent distinctive marks. The leaves of A. aurea are somewhat narrower and the flowers bright yellow. Walter places it under A. farinosa as a variety, and adds that he could not detect a specific difference; although the time of flowering and place of growth indicate that they are distinct. In sensible properties they are similar.

In the London Philosophical transactions for 1730, a plant is mentioned by Clayton, which, though not described in botanical language, leaves little doubt that the Aletris farinosa is intended. He says, "there is another root of the species of hyacinths; the leaves are grass-like, but smooth and stiff, of a willow-green colour, and spread like a star on the ground. From the middle shoots a tall, long, rush-like stem, without leaves, near two feet high; on one side grow little white bell-flowers one above another. The root is black outwardly, but brown within. It is bitter and probably has the same virtues as Little Centaury. Some call it *ague grass*, others *ague root*, others *star grass*."

The root of the Aletris is highly resinous, and appears to contain a portion of extractive matter. The tincture, made by digesting the root in alcohol, is intensely bitter, and assumes a milky turbidness if water be added to it. The decoction is moderately bitter, and is not disturbed by alcohol. With chalybeate solutions it undergoes little change. The tincture is to be considered a stronger preparation than the decoction, although the latter has a good share of the virtues of the plant.

The bitterness of this vegetable has brought it into notice in the quality of a tonic and stomachic. I have been informed of its use for this purpose by physicians in different parts of the country. The most common mode of its employment, I understand, is by infusion or decoction. Pursh speaks of it as a remedy in the colic, but on what principle it can operate in relieving that disease, I am at a loss to say.—The amount of bitter resin, which the plant contains, led me to suspect that it might possess some of the properties of aloes, to which the plant is botanically related; but on trial, made in several instances with the root in powder, a dose of ten or twelve grains produced no effect of this kind whatever. A physician, who experimented with larger quantities, with a view to test this quality, informed me that a dose of twenty grains occasioned much nausea and tendency to vomit, followed by some dizziness; but that no cathartic operation took place.

Dr. Cutler, in his account of the plants of New England, informs us, that this plant has been considered useful in chronic rheumatism; but does not mention the dose or preparation.

As far as we can sum up the testimony hitherto offered respecting the general properties of

this plant, it appears that the infusion or decoction acts as a tonic in small doses. Indeed the exhibition of large ones would be inconvenient from the extreme bitterness of the plant. The powder, in small quantities, produces no immediate visible effect, except that it has appeared to invigorate the appetite. In large doses it disturbs the stomach, and possibly exerts some narcotic effect on the system. It remains to be determined whether these consequences are attributable to the resin, which the infusion does not dissolve; or whether the largeness of the dose is alone instrumental. It is well known that the stomach does not tolerate even gentian or any common bitter in large dose. And it seems probable that if the Aletris should ever increase in reputation as a tonic bitter, it will only be by its use in limited quantities.

## BOTANICAL REFERENCES.

Aletris farinosa, Linn.—Willd. *Sp. pl.* ii. 185.—*Bot. Mag. t.* 1418.—Aletris alba, Michaux, *Flora.* i. 189.—Pursh, i. 225.—Hyacinthus floridanus spicatus, Plukenet, *amalth.* 119, *t.* 437, *f.* 2.—Hyacynthus caule nudo, &c.—Gronov. *Virg.* 38.

## MEDICAL REFERENCES.

Clayton, *Phil. Trans. abr.* viii. 333.—Cutler, *American Acad.* vol. i. 435.

## PLATE L.

Fig. 1. *Aletris farinosa.*

Fig. 2. *Corolla opened to shew the insertion of the stamens.*

Fig. 3. *Stamen magnified.*

Fig. 4. *Pistil magnified.*

2

*Rhododendron maximum*

# AMERICAN MEDICAL BOTANY.

## RHODODENDRON MAXIMUM.

*American Rose bay.*

*PLATE LI.*

The scenery of the American forest is distinguished not less by the greatness of its natural features, the imposing and picturesque appearance of its mountains, its rocky precipices, its broad streams and lakes; than it is by the magnificent clothing of wild shrubs and trees, the uncommon beauty of which, gives to rough and inaccessible spots a richness, that cultivation can hardly imitate. The Kalmia, described in our first volume, and the Rhododendron of the present article, which are reared with care and difficulty as ornaments of European gardens and pleasure grounds, can be seen in perfection no where but in the uncultivated recesses of our own continent.

Near the summits of mountains, on the banks of torrents and deep ravines, from which rivers take their rise, where the deep shade, moist soil and dashing water, preserve the atmosphere in a state of perpetual humidity; these shrubs, in luxuriant size and vigour, are seen to cover tracts of great extent, at one season presenting an unbroken landscape of gorgeous flowers, and at another with their evergreen foliage forming an impenetrable shelter for the wild animals of the forest.

Of the Rhododendron maximum, Mr. Pursh has designated three varieties. These are, 1. The Red, which inhabits swamps and the borders of mountain lakes from Canada to Carolina; 2. The White, found in the swamps of New Jersey and Delaware; 3. The Purple, on the highest mountains of Virginia and Carolina. This last variety is represented as peculiarly magnificent, growing to the size of a small tree, having its trunk eighteen inches and more in diameter, and its foliage triple the size of any other species.

The first variety of this elegant shrub grows abundantly on the banks of Charles river, a dozen or fifteen miles from Boston. It even supports the winter as far north as the state of Maine, and was observed, by Dr. Eaton, growing plentifully

on the borders of Sebago lake near Portland. It does not bear transplantation well, but is apt to dwindle after the first or second year. It succeeds best when removed to a damp springy soil, and to a situation calculated to afford it shelter from the sun.

The Rhododendron, of the Northern states, is a large straggling shrub, very irregular in its mode of growth. The bark is of a greyish colour, very much cracked and broken. The leaves are in tufts at the ends of the branches. They are evergreen, coriaceous, on round fleshy petioles, oblong-oval, entire, revolute at the edges, and pale underneath. Both leaves and petioles, when young, are covered with a light woolly substance. The flowers form a terminal cluster or thyrsus immediately above the leaves, the stalks and calyces of which are covered with a glutinous pubescence. Previous to its expansion, the whole bunch forms a large compound bud, resembling a strobilus or cone, each individual flower-bud being covered by a rhomboidal bracte, which falls off when the flower expands. Calyx small, of five unequal obtuse segments. Corolla monopetalous, funnel-shaped, with a short tube, the border divided into five large, unequal segments, which are white, shaded with lake, the upper and

largest, having a collection of orange coloured spots at its centre. Stamens declinate, unequal; the filaments white, thickened and hairy at base; anthers two celled, opening by two pores at top; pollen white. Germ ovate, hairy, glutinous; style declinate, equal to the longest stamens, thickened upwards; stigma a rough surface with five points. Capsule ovate, obtusely angular, five-celled. Seeds numerous, minute.

Considered in its chemical character, this shrub is a resinous astringent. A decoction of the leaves gives strong proofs of the presence of tannin in large quantities. Both the bark and leaves, digested in alcohol, produce a resinous tincture, which is immediately rendered turbid by water. The glutinous covering of the flower stalks appears of a resinous nature. A decoction of the leaves in water affords nothing which is not soluble in alcohol, and did not alter by it in two days' standing.

I have been induced to examine the Rhododendron and to insert it in this work, on account of the reputation it has possessed of being poisonous. The late Professor Barton, in his collections towards an American Materia Medica, has given various intimations of this sort, the most conclusive of which is his expression, "This is

certainly a poison."—The result of my own attention to this shrub does not give reason for attaching to it suspicions of possessing a very deleterious nature. None of its external characters would lead to apprehensions of this sort, particularly the taste, which is simply astringent and herbaceous, and much like that of a common oak leaf. I know not what quantity might prove injurious, but under the conviction that the plant was not particularly dangerous, I have swallowed a green leaf of the middle size, so large that it required some resolution to masticate so unpalatable a morsel, but have found no ill effect whatever to result from it.

Medicinally considered, I think it must be ranked among the astringents, a place which both its sensible and chemical properties entitle it to hold. If it have any narcotic powers, they will probably be developed only by an extraordinary dose, which few persons will be likely to put to the test.

## BOTANICAL REFERENCES.

Rhododendron maximum, Willd. *Sp. pl.* ii. 606.—*Bot. Mag. t.* 951.—Schmidt, *Arb. t.* 121.—Pursh, i. 297.—Michaux, *N. A. Sylva, t.* 67.

## MEDICAL REFERENCE.

B. S. Barton, *Collections*, i. 18.

## PLATE LI.

Fig. 1. *A branch of Rhododendron maximum in flower and in bud.*

Fig. 2. *Calyx and style.*

Fig. 3. *Stamen.*

PL. LII.

*Euphorbia Ipecacuanha*

# EUPHORBIA IPECACUANHA.

## *Ipecacuanha spurge.*

=

### *PLATE LII.*

From the specific name given to this vegetable we infer, that before the true origin of the officinal ipecacuanha was known, this plant, among others, was for a time considered the source of that drug. The Pharmacopœia Danica was one of the works in which this reference was made, and Linnæus undoubtedly paid some respect to the opinion in assigning the specific name.

Nearly all the species of Euphorbia appear to possess the power of acting with violence on the stomach and alimentary canal. This power particularly resides in a milky juice which they exude on being wounded. Of the species which have been most extensively submitted to experiment are Euphorbia officinarum, esula, heliosco-

pia, dulcis, peplus, exigua, Cyparissias, palustris, and Characias. Professor Murray has collected details respecting the operation of most of these, from various medical authorities. It appears that they all excite vomiting or purging, and in large doses bring on violent burning pains of the stomach and bowels, heat and thirst, followed by great prostration of strength, cold sweats, and in some instance, death. In small quantities, however, they have been used as medicines with safety, although some of them are uncertain in regard to their dose, and difficult to manage in their operation. [*Note* B.]

The genus Euphorbia comprises a vast number of species, of different habit, size and mode of growth. The flowers are frequently minute, very complex, and difficult of examination. They have a *calyciform involucrum with four or five segments like petals, and the same number of interior segments like nectaries. Stamens twelve or more. Filaments articulated. Fertile flower solitary, stipitate, naked. Styles three, bifid. Capsule three seeded.*—The species *Ipecacuanha is procumbent, with opposite, obovate, oblong or linear leaves; peduncles axillary, one flowered, elongated.*

The genus was placed by Linnæus in the class *Dodecandria*, order *Trigynia*. Michaux, considering as separate male flowers, the bodies of stamens which correspond, in number, to the nectaries or lacinulæ, has referred the genus to *Monœcia, Monadelphia*. In this he has been followed by various American botanists.—In natural arrangements this genus is among the *Tricoccæ* of Linn. and *Euphorbiæ* of Juss.

The Euphorbia ipecacuanha is a low, tufted plant, growing in sandy soils in the Middle and Southern states. Michaux remarks, that the plants are sometimes buried in the sand. It is a polymorphous vegetable both in its shape and colour, the leaves continually differing in their outline, even in contiguous plants; and the colour varying from green to crimson.

The root is irregular and fleshy, very large in proportion to the plant it bears, running deep into the sand, sometimes, as Mr. Pursh informs us, extending to the depth of six feet. The stems, from one root, are numerous, erect or procumbent, forming large bunches on the surface of the ground. They are smooth, regularly dichotomous, and jointed at the forks. The leaves are inserted at the joints, opposite, sessile, smooth, having most frequently an oblong shape

though different plants possess every intermediate variety in the form of the leaf, from circular to linear. Their size and colour are likewise variable. The flowers are solitary on long peduncles from the forks of the stem. Calyx spreading, divided into five obtuse segments. Inner segments or nectaries five, small, gibbous. Stamens numerous, in five parcels, appearing, at different times, two or three together, with double anthers. The fertile flowers have a large, roundish, drooping, pedicelled germ, crowned with six revolute stigmas. Capsule three celled.

The dried root of the Euphorbia ipecacuanha is of a greyish colour outside, and white within. It is light and brittle and has about the hardness of cork. To the taste it is sweetish and not particularly unpleasant.

I subjected some portions of the root to chemical examination and obtained the following results.—Sulphuric ether digested on the powdered root dissolves a part of it ; and this ethereal solution gives a precipitate, if alcohol is added to it.—Alcohol alone takes up another portion of the root, and assumes a pearly turbidness after water is added. Both the ethereal and alcoholic solutions, evaporated to dryness, leave a residuum which is fusible and inflammable. The decoction

gives no precipitate with gelatin or sulphate of iron. With alcohol it gave out a white precipitate which rendered the solution turbid, and subsided in flocks. The cold infusion exhibited the same phenomena in a smaller degree. From these appearances we may infer that the root contains caoutchouc, resin, mucus and probably fæcula.

The Euphorbia ipecacuanha has long been known to possess the same property, which is so frequent in its genus, of exciting the stomach powerfully as an emetic. The appropriation of its specific name seems even to imply that such a property had been recognised in this species in a more eminent degree, than in the rest. It does not appear, however, that it has ever continued long in use, this being prevented, probably, by the suspicious character of the race of plants to which it belongs. The late Dr. Barton mentions this vegetable among his indigenous emetics, but considers it too violent and uncertain to be depended on as a safe medicine.

Within a few years the plant has been attended to by some medical gentlemen in Philadelphia, who report more favourably of its powers and mode of operation; and consider it as a safe, certain and manageable emetic, applica-

ble to most of the cases in which medicines of this kind are called for.

Being desirous to obtain personal knowledge of the medicinal character of this vegetable, I instituted trials with different parcels of the dried root, some of which were gathered by myself, in flower, near Philadelphia, and the rest sent me by friends from Baltimore and Washington. Portions of these roots were given to a variety of patients in the Dispensary and Almshouse by myself and by other physicians, who have obliged me by communicating the results of their observations. These experiments have led to the conclusion that the Euphorbia ipecacuanha in doses of from ten to twenty grains is both an emetic and cathartic; that it is more active than ipecacuanha in proportion to the number of grains administered; that in small doses it operates with as much ease as most emetics, in a majority of instances. If it fails, however, at first, it is not so safely repeated as the other emetics in common use. Given in large doses it excites active and long continued vomiting, attended with a sense of heat, vertigo, indistinct vision, and prostration of strength. I have not ventured upon any large dose myself, but have been informed, that such is the effect, by those who have given the root in

doses of two scruples and upwards. The plant appears to differ from the South American Ipecacuanha in having the degree of its operation proportionate to the quantity taken; the process of vomiting not being checked by the powder being thrown off of the stomach, as frequently happens, when common Ipecac is given in large doses.

At my request, Dr. James McKeen made this plant and another species, *E. corollata*, the subjects of an inaugural dissertation at Harvard University, in 1820. As his observations have been made with some care, and illustrate very fairly the action of the medicine, I insert the principal cases from his manuscript.

"*Case* I. The first experiment," he observes, "made with this species of the Euphorbia was upon a man of intemperate habits, about twenty seven years of age, and who appeared to be a candidate for Delirium Tremens. I gave him ten grains. He told me that it always required powerful doses of medicine to produce any effects upon his stomach or bowels, but as I was then a stranger to the powers of the Euphorbia ipecacuanha, it was thought prudent not to hazard a large quantity until something had been ascertained of its strength. When I called in the

morning after it was taken, I learned that the medicine had produced a gentle purging, preceded by a considerable degree of nausea, but that there had been no vomiting.

"*Case* II. The next fair opportunity which occurred for experiment was in the case of a female about thirty seven years of age. This woman, for a considerable portion of her life, had suffered from syphilis; nothing remained now, however, specifically of this kind, excepting the marked effects of a constitution shattered by disease. I gave her at first ten grains of the Euphorbia ipecacuanha, and in twenty minutes, no signs of vomiting occurring, I gave her eight grains more, and kept adding to the quantity, which she had taken, until it amounted in the whole to forty grains. I remained by this patient until vomiting commenced, which was precisely thirty five minutes after the exhibition of the first ten grains. As the influence of the mind, in contemplating the effects of an emetic, will often induce its more speedy operation, I diverted the patient's attention as much as possible, that no consequences might ensue, but such as were produced by the specific action of the medicine. As soon as I ascertained that this Euphorbia ipecacuanha was likely to produce effectual

vomiting, I left the house. About thirty hours afterwards I called to see this patient, and with much surprise found that the quantity I had given her had continued to operate by emesis and catharsis ever since. She was, however, very little exhausted, and there was nothing of cramp either on the stomach or extremities which so often distress those who are too severely vomited. About this time there was a cessation of vomiting without the assistance of remedies. Two days afterwards this woman told me she had not been as well as she then was for a number of years. The powerful vomiting produced a considerable degree of dizziness, but this went off in the course of twenty four hours. I had quite despaired of vomiting this patient with the Euphorbia ipecacuanha. In no instance afterwards was this medicine more than half as long in producing vomiting as it was in this case.

*Case* III. A girl of about eighteen years of age, whose manner of living was similar to that of the person mentioned in the preceding case, applied to me for an emetic; I gave her thirty grains of the Euphorbia ipecacuanha, and told her to take half of this quantity, and if it did not operate in half an hour, she might take the remainder. Contrary to my injunctions she took

the whole at a single draught. In fifteen minutes her attendants told me she began to vomit, and continued to throw up, at intervals, smartly for five hours, and was purged seven or eight hours more. For some time after this she complained much of dizziness.

*Case* IV. As I had found, in the first trial, that ten grains of the Euphorbia ipecacuanha failed to produce vomiting, I tried the same dose upon another subject, which was a woman of about forty eight years of age, to determine if so small a quantity would produce vomiting. In about fifteen or twenty minutes after the medicine was received into the stomach, it began to operate. After she had vomited three times, it commenced purging, and produced three or four evacuations. This woman did not complain of any dizziness, as those did in the two preceding cases.

*Case* V. A woman about thirty one years of age took fifteen grains of the Euphorbia ipecacuanha; in seventeen minutes it began to operate, and vomited the patient every few minutes, until the operation amounted to five or six times, and afterwards a moderate purging ensued. The operation, in this case, was more satisfactory than any preceding ones, as it effectually evacuated

the stomach and bowels, without a too long continuance of the vomiting.

*Case* VI. A man of forty years of age was seized with symptoms of fever. Four grains of sulphate of copper and twelve of common ipecac were given. This dose produced no emetic operation, but occasioned violent purging. Forty eight hours after, I gave him twenty grains of Euphorbia ipecacuanha, in powder, which produced very effectual evacuations from the stomach, vomiting him eight or nine times; after which he had one or two alvine discharges.

*Case* VII. In one instance, for experiment, I gave four grains of this plant; but it neither affected the stomach nor bowels, nor the feelings of the patient, nor his pulse."

From what is now known respecting the Euphorbia ipecacuanha, we are justified in considering it an active emetic, and, if prudently administered, more safe than a majority of the species of its genus. It wants, however, the peculiar mildness of the officinal Ipecacuanha, which, in cases of slow operation, permits the dose to be accumulated by repetition, until its due effect takes place, without danger of excessive violence in the length and degree of evacuation, and without an injurious impression on the

nervous system. This, indeed, appears to be the common defect of the active North American emetics hitherto examined. And until a more extensive examination has brought to light new substances of this class, or better defined the modes of preparation and use of those already known, we cannot wish that the South American drug should be diminished in our markets, or less familiar to our physicians.

## BOTANICAL REFERENCES.

Euphorbia Ipecacuanha, Linn. *Sp. pl.*—Willd. ii. 900.—Michaux, *Flora.* ii. 212.—Pursh, ii. 606.—*Botanical Magazine, t.* 1494.—Euphorbia inermis, &c.—Gronovius, *Virg.* 74.—Tithymalus flore minimo herbaceo ?—Clayton, *Phil. trans. abr.* viii. 331.

## MEDICAL REFERENCES.

Schœpf, *Mat. Med.* 74.—B. S. Barton, *Coll.* 26.—W. P. C. Barton, *Veg. Mat. Med.* vol. i.

## PLATE LII.

Fig. 1. *Euphorbia Ipecacuanha.*

Fig. 2, 3, 4, 5. *Different forms and sizes of the leaf observed in individuals of this species.*

Fig. 6. *Red variety of the leaves.*

Fig. 7. *Calyx.*

Fig. 8. *Calyx opened, with five of the stamens expanded.*

Fig. 9. *A perfect flower.*

Fig. 10. *Styles and stigmas magnified.*

PL. LIII.

2 3 1 4 5

*Euphorbia corollata*

# EUPHORBIA COROLLATA.

## *Large flowering spurge.*

=

### *PLATE LIII.*

In point of stature and the shewy appearance of its flowers, this species of Euphorbia differs eminently from that described in the last article. In the common features, however, of the genus, such as its lactescence, its taste, and its medicinal powers; the consanguinity of the two plants evidently appears. I am not aware that this species has been much known for its operative qualities, until within a very recent period. The indians were, indeed, acquainted with the medicinal properties of more than one species of Euphorbia. They doubtless made use of the E. ipecacuanha, and not impossibly of the present species also. In Mr. Clayton's letter to Dr. Grew, contained in the Transactions of the Royal society for 1730, and which we have noticed

in speaking of Aletris farinosa, the writer states, that the Aborigines made use of "the roots of Tythymal, of which there are two sorts, the one *flore minimo herbaceo*, the other *flore albo*. The flower of this last," he says, "is small, but large in comparison with the other. They are *repentes*, and grow in old manured grounds. They chiefly make use of the latter of these, and it is a most excellent purge, though it sometimes vomits. It is quick but moderate in its effect, and has this peculiarity, that it opens the body, when other more violent purgatives will not move it." We might safely conclude that the white flowering species, here noticed, is the Euphorbia corollata, were it not for the term *repentes* applied to both plants. It is not improbable that in this respect, the writer might have been misinformed.

Pursh informs us that Euphorbia corollata grows in dry fields from Canada to Carolina. I have never met with it north of Pennsylvania. The drawing which illustrates our description is from a specimen cultivated in the Botanic garden at Cambridge. It is a tall, erect plant, from one to five feet in height, resembling, at a distance, some of the white flowering *corymbiferæ*. It begins to flower in June, but is not fully expanded until July or August. Its specific

character is as follows. *Umbel five rayed, three parted, dichotomous; leaves and involucra oblong, obtuse; segments of the calyx obovate, petaloid, coloured.* The shape of the leaves is subject to variety, as is also their smoothness or hairiness.

This plant has a large branching root which sends up a number of stems, frequently from two to five feet in height. They are erect, round and in most instances simple. The leaves are scattered, sessile; oblong, obovate or linear, a little revolute at the margin, smooth in some plants, very hairy in others. The stem divides at top into a large five rayed umbel, supported by an involucrum of as many leaves. Not unfrequently a small axillary branch or two arise from the sides of the stem below the umbel. The rays of the umbel are repeatedly trifid or dichotomous, each fork being attended by two leafets and a flower. The top of the stem or centre of the umbel is turgid, and often bears a precocious flower. The calyx is large, rotate, white, with five obtuse petal-like segments, from which the name of the species has been taken. The nectaries or inner segments are five, very small, obtuse projections situated at the base of the segments. Stamens a dozen or more emerging two or three at a time, with double anthers.

Germ pedicelled. Capsule three celled. A great portion of the plants are wholly staminiferous.

The results of a short chemical examination of this plant were very similar to those afforded by E. ipecacuanha. The ethereal solution was made turbed by alcohol, and the alcoholic by water. The precipitate in the last instance seemed denser and more abundant than it was in the former species. The decoction deposited a mucus or feculent substance, by means of alcohol, as in the other plant. The same sweetish taste characterised the solutions of both vegetables.

It has been observed, by late experimenters in vegetable chemistry, that most of the lactescent or milky plants contain caoutchouc. That they contain a substance of this nature, which is dissolved by ether and not by alcohol, I am able to attest from the examination of various lactescent plants inserted in this work, and some others.

The properties of Euphorbia corollata have been lately brought into notice by W. Zollickoffer, M. D. of Baltimore, to whom I was first indebted for my specimens of the root and living plant; and who has furnished me with a variety

of facts relating to its properties. Dr. Z. states that this plant is quite common in some parts of the state of Virginia. In some districts of Maryland, and more particularly in Anne Arundel county, it grows in the greatest abundance, where it is recognised by the common appellations of Milkweed, Snake's milk, Ipecacuanha and Indian Physic. It delights in a poor, dry, and sandy soil. It is seldom or never found growing in the woods, but in fields that are cultivated every two or three years. The farmers have frequently told him that it is very hurtful to small grain, when it grows in great quantities, and the common means that are made use of, such as ploughing and harrowing, in order to kill *bluegrass*, have the effect of increasing the quantity and rapid growth of this plant. It is never eaten by animals. The root is sometimes used as an emetic by the country people ; and it is esteemed in the cure of dropsy. The stalks, which arise from the common trunk of the root, are sometimes as many as thirty, and from this down to a single one. The largest roots, which he recollects seeing, measured from an inch to two inches and a half in circumference. He has been in the habit of using the Euphorbia corollata, for some time past in practice, as an emetic,

in the place of the Ipecacuanha of the shops; and thinks it in no respect inferior to this article. Combined with opium and the Sulph. potassæ in the proportions of the Pulv. doveri, he has found it to be a valuable diaphoretic. The contused root, in its recent state, will excite inflammation and vesication, when applied to any part of the body; which generally goes off in the course of four or five days whithout being attended with any inconvenience whatever. He was led to give it a number of trials in this way from the circumstance of his face becoming considerably inflamed after having handled large quantities of the root. As an expectorant, this plant, he says, is deserving of the attention of practitioners.

Dr. Z. has furnished me with minutes of seventeen cases, in which he administered the powdered root of this plant in doses of from ten to twenty grains. In all of these it operated by vomiting, with the exception of two cases, where it produced nausea, followed by catharsis. Having tried a variety of preparations, he states, that the extract may be given in doses of from five to eight grains; the wine prepared in the same way as Vinum ipecacuanhæ, in dose of an ounce or an ounce and an half. Of the root in powder from fifteen to twenty grains was found a proper

emetic. He considers this medicine as having a peculiar advantage in possessing no unpleasant taste; being only followed by a sense of heat in a few minutes after it is taken. But this is by no means lasting, nor does it produce any material uneasiness.

In some experiments, to determine the soluble portions of this root, Dr. Z. found that two thousand one hundred and sixty grains of the recent root afforded one hundred and two grains of watery extract; and a like quantity by digestion in alcohol gave one hundred and twenty three grains of alcoholic extract. He did not observe any difference in the activity of these two extracts.

Dr. McKeen, whose Dissertation on the species of Euphorbia has been already cited in the last article, has detailed the circumstances of twelve cases, in which he administered the Euphorbia corollata. His experiments differ from those of Dr. Zollickoffer, in the quantity of the root used, being always smaller. The doses, which he gave, were from three to twelve grains of the powder. In every instance the medicine operated as a cathartic. In most of the cases nausea was produced, but in three only, out of the whole number, it was followed by vomiting.

In one case a dose of three grains proved actively cathartic in four hours. In another five grains produced vomiting. In a third no effect was experienced from twelve grains, except that of a moderate laxative. In one instance twenty grains were given, which produced vomiting three times, followed by about twenty alvine evacuations.

I have placed portions of this plant in the hands of several practitioners and medical students, with a request to be informed of the effect, when suitable opportunities for its exhibition had occurred. In a majority of the instances I have been told, that a cathartic operation had followed its use; and sometimes, though less frequently, an emetic. It rarely has proved inactive.

The Euphorbia corollata must undoubtedly be ranked among the more efficient medicines of the evacuating class. Dr. McKeen concludes, from his experiments, that it is a very certain purgative, possessing, he thinks, about double the strength of jalap. It exerts its cathartic efficacy in doses of less than ten grains. If given to the amount of fifteen or twenty grains, it is very sure to prove emetic; the proportion of its failures, being not greater than occurs in the use of other emetic medicines. The only inconveniences which have come to my knowledge, as

attending it, are, that if given in small doses, for a purgative, it is apt to produce nausea; while in the large doses suitable for an emetic, it sometimes has induced a degree of hypercatharsis. But it must be observed, that many of the medicines, in common use, may occasion similar consequences in persons of peculiar habit and irritable fibre. Future experiment will, no doubt, determine whether the Euphorbia corollata is any more irregular and unmanageable than other medicines of its kind, or whether it is entitled to a permanent and useful place in the Materia Medica.

Many, and perhaps all the species of Euphorbia are powerful external stimulants. Several are used as a sort of caustic to destroy warts. The gum, called Euphorbium, produced by the Euphorbia officinarum, is a strong vesicatory, employed by farriers, and sometimes used to adulterate the plaister of Cantharides. The blistering power of E. corollata has been stated by Dr. Zollickoffer. This active genus of plants deserves a thorough investigation with a view to this particular property, to determine whether they are safe and manageable vesications, or virulent and uncertain.

## BOTANICAL REFERENCES.

Euphorbia corollata, Linn.—Willd. ii. 916.—Michaux, ii. 210.—Pursh, ii. 607.—Tithymalus marianus, &c.—Plukenet, *Mant.* 182. *t.* 446. *f.* 2.

## MEDICAL REFERENCES.

Clayton, *Philosophical transactions abridged*, viii. 331.—Zollickoffer, *Materia Medica. Baltimore*, 1819.

## PLATE LIII.

Fig. 1. *Euphorbia corollata, the top of a plant rather below the common size.*

Fig. 2. *Barren flower.*

Fig. 3. *Calyx not fully expanded.*

Fig. 4. *Stamen.*

Fig. 5. *Fertile flower.*

PL. LIV

Polygala rubella

Annan & Swan

# POLYGALA RUBELLA.

## *Bitter Polygala.*

=

*PLATE LIV.*

THIS plant is interesting from the curious manner in which a part of the fruit is produced, by a kind of imperfect flower growing close to, and in some instances under, the surface of the ground. It is not the only species of the Polygala which has this peculiarity. I have often observed little shoots at the root of P. paucifolia, one of the most beautiful of the genus, bearing apterous flowers and subterranean fruit, precisely like those represented in our plate. The P. polygama, of Walter and Pursh, if, indeed, it is a distinct species, has the same remarkable mode of growth. It is difficult to imagine what end is attained by nature in this singular arrangement, by which a part of the seeds are ripened in the sun, while the rest, like the fruit of Arachis hypogæa, is

buried from the light. To the eye there is no difference between seeds taken from the upper or lower racemes of the plant. It would be worth while to ascertain if the two will vegetate equally well.

The genus is marked by a *calyx of five leaves, two of which are wing-like and coloured. Capsule obcordate, two celled and two valved.* The species *rubella* has its *stems simple; leaves linear-oblong, mucronated; flowers racemed, those of the stem winged, those of the root apterous.*

Class *Diadelphia*, order *Octandria*; natural orders *Lomentaceæ*, Linn. *Pediculares*, Juss.

The Polygala rubella, here described, is the plant designated by that name in Muhlenberg's catalogue, as I have formerly learnt from the author himself. There is little doubt that Willdenow's plant is the same, described from an imperfect specimen. It is found in dry, sandy, or gravelly soils in many parts of the United States, and flowers in June and July.

Root somewhat fusiform, perennial, branching. Stems numerous, ascending, smooth, angular, simple. Leaves scattered, smooth, the lower ones obovate, smaller; the upper ones linear-lanceolate, obtuse, mucronated, sessile. Flowers purple, short-crested, in terminal racemes.

Bractes small, ovate-lanceolate, caducous. Wings of the calyx rhomboid-oval, obtuse, with a slight middle nerve. Corolla small, closed, of three segments, the middle one largest and crested by the division of its sides and extremity. Anthers eight, forming a double row, the filaments coalescing. Germ compressed, inversely heart-shaped; style deflexed; stigma bearded inside, with a prominence below it. Capsule inversely heart-shaped, nearly smooth, margined, and invested with the wings of the calyx. Seeds two, obovate, hairy, with a transparent appendage or strophiole on the inside. From the base of the stems proceed a number of prostrate shoots situated upon, and sometimes nearly under the ground, bearing a row of incomplete fertile flowers. These flowers are furnished with a calyx without wings, a minute corolla and stamens, and a short style. The germ and fruit precisely resemble those of the more perfect flowers.

Like some of the European species which it resembles in habit, this plant is a strong and permanent bitter, imparting its sensible properties both to spirit and to water. I digested a portion of the dried plant in ether, and added alcohol to the solution. No change was visible at the time of mixture, but on standing till the

ether had partly evaporated, the alcohol became turbid. A tincture of the plant was not immediately affected by adding water, but on standing over night it became very turbid, and in a few days deposited a large precipitate. The bitterness, which is probably of the extractive kind, was communicated to cold, as well as hot water; and to alcohol. The aqueous solutions appear strong enough to represent the virtues of this vegetable.

The Polygala rubella, from its extreme bitterness, has attracted the notice of various medical practitioners in the Northern states. I have been assured by those who have tried its efficacy, that the infusion administered in small doses, proves a useful tonic and stimulant to the digestive organs. In large doses it opens the body and excites diaphoresis. Its powers appear to resemble those of Polygala vulgaris and P. amara of Europe, to which it has a close botanical resemblance; and which have enjoyed a certain degree of medicinal reputation as tonics and expectorants.

## BOTANICAL REFERENCES.

Polygala rubella, MUHLENBERG, *Catal.*—WILLD. iii. 875.—PURSH, ii. 464.—Polygala polygama ?—NUTTALL, *genera*, ii. 87.

## PLATE LIV.

Fig. 1. *Polygala rubella.*
Fig. 2. *A flower.*
Fig. 3. *Calyx.*
Fig. 4. *Corolla magnified.*
Fig. 5. *Fruit of ditto.*
Fig. 6. *Body of stamens.*
Fig. 7. *Pistil.*

# NYMPHÆA ODORATA.

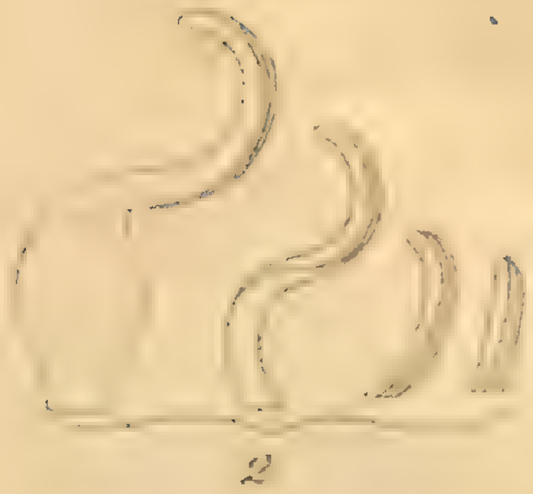
*Sweet scented Water lily.*

=

*PLATE LV.*

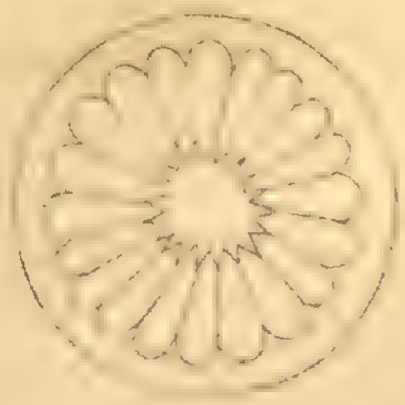
THE common Water lily, of North America, very much resembles that of Europe in its external form, but differs remarkably in the fine fragrance of its flowers, those of the old continent being nearly destitute of odour. It belongs to a very beautiful tribe of aquatic plants, a great part of which are natives of the torrid zone. Those species which support the cold of our northern latitudes, are enabled to do so only by the depth of water, under which it is their habit to vegetate. Nature has provided a sort of spontaneous hotbed for these plants, by placing their roots at such a depth from the surface of the element in which they grow, that the frost, which would otherwise prove fatal, does not reach them at the coldest season.

1



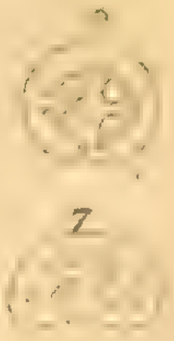
2

3



4

5



6

. Nymphaea odorata

The Nymphæa odorata, the finest of the northern species, grows abundantly in most parts of the United States, about the edges of rivers and ponds, where the water is more than a foot in depth. It is one of the largest of our native flowers, and though it has often been represented as inferior, in size, to the water lily of Europe, I am sure that this comparison can only have resulted from the inspection of cultivated specimens. The annexed drawing was made from a full grown and fully expanded specimen, and is actually smaller than the flower from which it was taken.

Every angler is familiar with the leaves and stems of this plant, which, with a few similar aquatics, forms floating beds about the edges of deep fresh waters, affording to the fish a favourite shelter from the light; and often rendering them more essential service, by entangling the hooks and lines of their pursuers.

The roots of this plant creep through the muddy bottoms of ponds to a great extent. They are very rough, knotted, blackish, and as large as a man's arm. The porous stalks, which proceed from these, are bouyed up by the quantity of air they contain, and continue to be elongated till they reach the surface of the water, which is

often at the height of several feet. The upper side of the leaves has a highly repellent power for water, owing to its finely polished surface, from which the fluid rolls off as from a coating of oil. When the buds have attained to maturity, they emerge and expand their flowers. This takes place in the morning; and when the sun is bright, a bed of these flowers presents a truly magnificent spectacle. Owing to the concavity of the calyx and petals they continue to float during a great part of the day. They are seldom elevated from the surface, except when the stem is uncommonly large, or pushed upward by some displacement of the adjacent leaves. At night, or before, the flowers close, and either rest on the surface or sink beneath it till the subsequent day. When flowering is over, the germ sinks to the bottom and there ripens its fruit.

The genus Nymphæa is now separated from some other plants formerly attached to it by the following character. *Calyx four or five leaved; petals many, inserted into the germ below the stamens; stigma radiated, sessile with a tubercle in the middle; berry many celled, many seeded.* This species very nearly resembles the *N. Alba* of Europe, but appears distinct by the following marks. *Leaves orbicular-cordate, entire, the lobes*

*acuminate, and veins prominent beneath; calyx four-leaved, equal to the petals.*—Linnæus placed this genus in his *Miscellaneæ*, and Jussieu with the *Hydrocharides*.

The stalks, both of the leaves and flowers, spring directly from the root. They vary in length from one foot to five or six, according to the depth of the water. The petioles are somewhat semicircular, the scapes round. Both are perforated throughout by long tubes or air-vessels which serve to float them. The leaves, which swim on the surface, are nearly round with a cleft or sinus extending to the centre, at which the petiole is inserted in a peltate manner. The lobes on each side of this sinus are prolonged into an acute point. The upper surface is of a bright glossy green almost without veins; the lower surface is reddish and marked by a multitude of strong prominent veins diverging from the centre. The calyx has four lanceolate leaves, green without and white within. Petals numerous, lanceolate, of a delicate whiteness, with sometimes a tinge of lake on the outside. Stamens numerous, yellow, in several rows; the filaments dilated, especially the outer ones, so as to resemble petals; the anthers in two longitudinal cells growing to the filaments and opening

inwardly. The stigma has from twelve to twenty four rays, very much resembling abortive anthers, at first incurved, afterwards spreading. At the centre is a solid hemispherical protuberance, usually called a nectary, but which appears to me more like the true stigma.

The roots of this plant are among the strongest astringents, and we have scarcely any native vegetable which affords more decided evidence of this property. When fresh, if chewed in the mouth, they are extremely styptic and bitter. Their decoction instantly strikes a jet black colour with sulphate of iron, and yields a dense, white precipitate to a solution of gelatin. With alcohol it deposites a slight flocculent substance resembling fæcula. Tannin and gallic acid in large quantities are to be considered its most characteristic ingredients.

The flowers have a delicious odour, hardly surpassed by any perfume which the summer produces. This fragrance is perfect only when the flowers are fresh, and, as they droop, becomes contaminated with the common smell of aquatic plants. It is peculiar in its character, and resembles that of no other plant with which I am acquainted. I have several times attempted to separate this perfume by distillation both with

water and spirit, but have never succeeded in preserving it in the faintest degree. It is much more fugacious than the perfume of roses, and seems to be destroyed by the application of heat. Possibly the employment of a large quantity of flowers at a time might yield a better product. The stamens appear more odorous than the petals, or at least preserve their odour longer in drying.

The roots of the water lily are kept by most of our apothecaries, and are much used by the common people in the composition of poultices. They are, no doubt, often injudiciously applied to suppurating tumours, since their astringency must be rather discutient, than promotive of suppuration. They are occasionally used by physicians in cases where astringent applications are called for, and answer a purpose somewhat analogous to that of lead poultices and alum curds. The roots, which, when fresh, are large and fleshy; in drying, lose a great part of their weight and size, becoming spongy and friable.

The Nymphæa alba of Europe, which appears perfectly similar in its qualities to the American plant, was celebrated by the ancients, [*Note* C.] as an antaphrodisiac, and as a remedy in dysentery and some other morbid discharges. To the

latter purpose its astringency might, in some instances, make it well suited. The roots and seeds of the Nymphæa lotus were used by the ancient Egyptians as bread.

## BOTANICAL REFERENCES.

Nymphæa odorata, WILLD. *Sp. pl.* ii. 1153.—*Bot. Mag.* 819.—*Bot. Repository*, 297.—PURSH, ii. 368.—Nymphæa alba, MICHAUX, i. 311.—WALTER, *Carol.* 155. Castalia pudica, SALISBURY, *Annals of Bot.* ii. 71.

## MEDICAL REFERENCE.

CUTLER, *Amer. Transactions*, i. 456.

## PLATE LV.

Fig. 1. *Leaf and flower of Nymphæa odorata.*
Fig. 2. *Different stamens from the same flower.*
Fig. 3. *Stigma.*
Fig. 4. *Section of the germ.*
Fig. 5. *A cell of the germ magnified.*
Fig. 6. *Section of the scape.*
Fig. 7. *Section of petiole.*

PL. LVI.

*Prunus verticillata.*

Arnout v. Strydt

# PRINOS VERTICILLATUS.

## *Black Alder.*

*PLATE LVI.*

After the leaves have fallen in autumn, this shrub becomes conspicuous by its glossy scarlet berries, which adhere in bunches, for a long time, to the sides of the branches. Of the objects which impart any liveliness to this season of decay, the most noticeable are those which change the hue of their leaves from green to red, as the oaks, the vaccinia, &c. those which flower late, as the Hamamelis, and those whose fruit attains to maturity under the influence of frost, and appears fresh and vegetating, while other things are withering about them. The species of Prinos are of the last description.

This genus consists of shrubs, a part of which are deciduous, and a part evergreen; bearing small lateral or axillary flowers. It is nearly

related to the *Ilices* or Hollys, differing chiefly in the number of its parts. Its character is formed by *a six cleft calyx, a monopetalous subrotate six cleft corolla, and a six seeded berry.* The Prinos verticillatus has *its leaves deciduous, oval, serrate, acuminate, slightly pubescent beneath ; flowers axillary, aggregate.*

These shrubs have usually been referred to *Hexandria Monogynia.* The present species and some others having different flowers on separate plants, Michaux was induced to place them in Diœcia. The natural orders to which they are assigned are *Dumosæ* of Linn. and *Rhamni* of Juss.

The Black Alder, for so the shrub is usually called, is found in swamps and about the edges of streams and ponds from Canada to the Southern states. It is irregular in its growth, but most commonly forms bunches six or eight feet in height. The leaves are alternate or scattered, on short petioles, oval, acute at base, sharply serrate, acuminate, with some hairiness, particularly on the veins underneath. The flowers are small, white, growing in little tufts or imperfect umbels, which are nearly sessile in the axils of the leaves. Calyx small, six cleft, persistent. Corolla monopetalous, spreading, without a tube,

the border divided into six obtuse segments. The stamens are erect, with oblong anthers. In the barren flowers they are equal in length to the corolla, in the fertile ones, shorter. The germ, in the fertile flowers, is large, green, roundish, with a short neck or style, terminating in an obtuse stigma. These are followed by irregular bunches of bright scarlet berries, which are roundish, supported by the persistent calyx, and crowned with the stigma, six celled, containing six long seeds, which are convex outwardly and sharp edged within. These berries are bitter and unpleasant to the taste, with a little sweetness and some acrimony.

The bark of the Black alder is moderately bitter, but inferior in this respect to many of our shrubs and trees. It discovers very little astringency either to the taste, or to chemical tests. A decoction which I made of the dried bark underwent no alteration on the addition of dissolved gelatin, and only changed to a dark green with the sulphate of iron. Alcohol produced hardly any change. The tincture, in alcohol, was found moderately bitter, and was not altered by water.

The Black alder has had a considerable reputation as a tonic medicine, perhaps more than it

deserves. The late Professor Barton tells us, that the bark has long been a popular remedy in different parts of the United States, being used in intermittents and some other diseases as a substitute for the Peruvian bark; and on some occasions, he thinks it more useful than that article. "It is employed both in substance and in decoction, most commonly, however, in the latter shape. It is supposed to be especially useful in cases of great debility accompanied with fever; as a corroborant in anasarcous and other dropsies, and as a tonic in cases of incipient sphacelus or gangrene. In the last case," he says, "it is unquestionably a medicine of great efficacy. It is both given internally and employed externally as a wash."

Dr. Thacher recommends a decoction or infusion of the bark taken internally in doses of a teacupful, and employed also as a wash, for the cure of cutaneous eruptions, particularly of the herpetic kind.

I have had but little experience with the bark of the Prinos which gave me much satisfaction. Indeed the tests of tonic remedies are of a more ambiguous kind than those of most other medicines. Vegetable barks, which are bitter and astringent, are generally tonic, if they

have no more striking operation; and in this property they differ in a degree somewhat proportionate to their bitterness and astringency. Judging by these criterions, the Prinos is not entitled to hold a very exalted rank in the list of tonics. As a bitter it is at best but of the second rate, and in astringency it falls below a multitude of the common forest trees.

The berries are recommended by the writers above cited, as possessing the same tonic properties with the bark. They certainly possess some activity, which, in large quantity, is not of the tonic kind. I have known sickness and vomiting produced in a person by eating a number of these berries found in the woods in autumn.

## BOTANICAL REFERENCES.

Prinos verticillatus, Linn, *Sp. pl.*—Pursh, i. 220.—Prinos Gronovii, Michaux, ii. 236.—Prinos padifolius, Willd. *Enum. Berol.* 394.

## MEDICAL REFERENCES.

B. S. Barton, *Collections*, ii. 5.—Thacher, *Disp.* 324.

## PLATE LVI.

Fig. 1. *Prinos verticillatus, a branch in flower.*

Fig. 2. *Ripe berries.*

Fig. 3. *Calyx magnified.*

Fig. 4. *The rest of the flower ditto.*

Fig. 5. *Stamen of the barren flower magnified.*

Fig. 6. *Germ of the fertile flower ditto.*

1



2 3



4 5

*Salbertia angularis*

Annan & Swatch

# SABBATIA ANGULARIS.

## *American Centaury.*

=

### *PLATE LVII.*

UNDER the name of *Chironia angularis*, this plant has been familiar to physicians in the United States as a native bitter. As it wants the most distinguishing characters of Chironia, while it has others of a very different kind, particularly in the anthers and stigma; I have followed the example of Pursh and others in referring it to the genus Sabbatia of Adanson.

This genus is characterised by *a persistent calyx from five to twelve parted; a corolla from five to twelve parted; anthers finally revolute; stigma two parted, spiral; capsule one celled.* The Sabbatia angularis differs from the rest of the genus in being *erect, the leaves clasping, peduncles elongated and corymbose, segments of the calyx lanceolate, half as long as the corolla; stem square and winged.*

Class *Pentandria*, order *Monogynia*; natural orders *Rosaceæ*, Linn. *Gentianæ*, Juss.

This plant grows in damp rich soils throughout the Middle and Southern states, and is most commonly known by the name of *Centaury*. It is commonly from one to two feet high. The stem is erect, smooth, square, with the angles winged. Branches axillary, opposite. The leaves are opposite and ovate, but vary in length and width. They are heart-shaped at base, clasping half the stem, nerved, smooth, entire, acute. Flowers terminal, forming a large corymb. Tube of the calyx angular, with five broad segments. Corolla five parted with oval segments twice as long as the calyx. The anthers are oblong and slightly recurved at the time when the flower first opens. After shedding their pollen they become revolute and curl up, but never assume the spiral form like the anthers of Chironia. Germ ovate; style longer than the stamens, declined; stigma two parted, the segments separate at first, but gradually becoming twisted spirally together. Capsule one celled, two valved.

Every part of this plant is a pure and very strong bitter. In this quality, as well as in its medicinal properties, it is resembled by several

other species of the same genus. An extractive principle appears to be the seat of this property, as it is communicated alike to alcohol and water, and as the solutions in these fluids do not occasion precipitates from each other. There appears to be no astringency in the vegetable.

In the collections for an American Materia Medica by the late Professor Barton, we are told that this plant is a valuable tonic bitter resembling the Centaury of Europe, for which it was used by some practitioners on the supposition of its being the same plant. It had long been a popular remedy, and was much employed in the yellow fever of Philadelphia, in 1793.

In Mr. Elliott's Botany of the Southern states, we are told that the plant, in South Carolina, is a common remedy in intermittent fever. Some of the other species of the same family, particularly S. gracilis, are equally efficacious. It is deserving of remark, that a great number of vegetables, belonging to the same natural order, are highly bitter, and approved as tonic remedies.

From the use I have made of the Sabbatia, I have no hesitation in attesting its utility. It seems to me to rank among the more pure or simple bitters, and acts usefully as a stomachic and promoter of appetite and digestion. Beyond

this, I have no experience with it. It may be given in substance or in infusion, but the latter mode is generally preferred. This form is one in which it appears to be largely used by physicians in the Middle states. Dr. Chapman tells us, it is resorted to extensively by every class of practitioners, regular and irregular, in the intermittent and remittent fevers. He thinks it has the advantage over Peruvian bark of being susceptible of employment in every stage of these diseases.

## BOTANICAL REFERENCES.

Sabbatia angularis, PURSH, *Flora Amer.* i. 137.—ELLIOTT, *Flora* i. 285.—Chironia angularis, WILLD. *Sp. pl.* i. 1067.—MICHAUX, *Flora*, i. 146.

## MEDICAL REFERENCES.

B. S. BARTON, *Coll.* i. 15.—CHAPMAN, *Therapeutics*, ii. 417.—ELLIOTT, *l. c. supra.*

## PLATE LVII.

Fig. 1. *Sabbatia angularis.*
Fig. 2. *The stamen before it bursts, magnified.*
Fig. 3. *Stamen after bursting, do.*
Fig. 4. *Pistil magnified with the stigmas not yet twisted.*
Fig. 5. *Do. the stigmas having become spiral.*

PL. LVIII




*Erythronium Americanum*

# ERYTHRONIUM AMERICANUM.

## *Common Erythronium.*

=

### *PLATE LVIII.*

For a considerable time the genus Erythronium was considered as containing only one species, the *E. dens canis* of Europe and Asia. The American plant was considered, by Michaux, as a variety of the European, differing only in colour. Later botanists have, with propriety, separated it, and besides this, one or two other American species have been added to the genus.*

The natural order, called *Liliaceæ* by Linnæus, and *Lilia* by Jussieu, is perhaps not exceeded by any other, in the uniform elegance of all its spe-

* My friend Mr. F. Boott discovered a new species of Erythronium on the Camel's rump mountain in Vermont, which he calls *E. bracteatum.* Its character is *E. foliis inæqualibus, scapo bracteato.* In all the specimens gathered by that gentleman, the leaves were very unequal, one being twice the size of the other; the scape had also a lanceolate bracte near the top. The flower was yellow and about half the size of *E. Americanum.*

cies. The Lily, Tulip, Crown imperial, and Gloriosa are specimens of this order. They belong to the same artificial class and order *Hexandria trigynia*, and have a close affinity in all the parts of their structure. The Erythronium, which is generally called, I know not for what reason, *Dog's tooth violet*, is one of the smallest of the order.

This genus has *no calyx. Its corolla is inferior, six petalled; the three inner petals with a callous prominence on each edge near the base.* The common American plant has its *scape naked*, its *leaves lanceolate and involute at the point; and its style club-shaped and undivided.* It is an early flowering plant, being in blossom in the first part of May. It grows in woods and fields in the Northern and Middle states.

The root is a solid bulb, situated deep in the ground, brown outside, and white and homogeneous within. The whole plant is smooth and glossy. Scape naked, slender. Leaves two, nearly equal, lanceolate, veinless, of a dark brownish green, clouded with irregular spots, sheathing the scape with their base, and terminating in an obtuse callous point. Flower solitary, drooping. Petals six, lanceolate, yellow, the three outermost partly crimson on the outside,

the three innermost having an obscure tooth on each side near the base. In a clear sun the petals are expanded and revolute, but at night and on cloudy days, they are nearly closed. Filaments flat, anthers oblong-linear. Germ obovate, style longer than the stamens, club-shaped, three lobed at top and terminating in three distinct, but not detached, stigmas. Capsule oblong-obovate, somewhat pedicelled.

The bulb of this plant, judging from its texture and taste, is almost wholly farinaceous. When dry, it is mealy and free from any unpleasant flavour. Having lost my specimens of the root at the time of preparing this article, I was unable to submit this part to chemical examination. A tincture was prepared from some dried leaves and flowers, which gave evidence of resin being present, when tested with alcohol. Water distilled from the same parts had a rather disagreeable odour.

This vegetable possesses the power of acting on the stomach as an emetic. About twenty five grains of the green root and forty of the recently dried root have produced nausea and vomiting. When the root is fully and thoroughly dried, or when it has been exposed to heat, it appears to lose this property in a great measure.

In its power of acting on the alimentary canal, it resembles many other plants, which are related to it in botanical habit. The Squill, Colchicum, and Aloe are examples of this class, and even the common Daffodil and Tulip are found to be emetic. I have known a family of children to be taken with violent vomiting from having, by mistake, dug up, roasted and eaten some Tulip roots, supposing them to be Artichokes.

It is probable that the medicinal activity of the Erythronium is of a volatile nature, capable of being dissipated by heat. Its farinaceous portion, when duly separated, is no doubt innocious. Gmelin, in his Flora Sibirica, states, that the Tartars collect and dry the roots of Erythronium *dens canis*, and boil them either with milk or broth, and consider them as very nutritious food. They are said nearly to resemble salep. It is remarkable that farinaceous roots, which possess active and even virulent qualities, do not impart them to the fæcula, which constitutes so large a portion of their bulk. The different species of Arum, Calla, and the Jatropha Manihot are examples of this fact, affording nutritious bread, although their crude juices are more or less poisonous.

The leaves of the American Erythronium are said to be more active than the root, but on this subject I am not fully informed. It is probable that the recent leaves have more activity than the dry.

## BOTANICAL REFERENCES.

Erythronium Americanum, KER, *Bot. Mag. t.* 1113.—NUTTALL, *Genera*, i. 223.—E. lanceolatum, PURSH, i. 230.—E. longifolium, POIRET, *Encycl. Methodique*.—E. flavum, SMITH, *Rees' Cycl.*—E. dens canis, MICHAUX, *Flora*, i. 198.

## PLATE LVIII.

Fig. 1. *Erythronium Americanum, the flower rather more drooping than common.*

Fig. 2. *One of the inner petals.*

Fig. 3. *Stamen.*

Fig. 4. *Pistil.*

Fig. 5. *Stigma magnified.*

Fig. 6. *Root.*

# XANTHOXYLUM FRAXINEUM.

*Prickly Ash.*

=

*PLATE LIX.*

THE Prickly Ash is a shrub of middling height, found in woods and moist or shady declivities in the Northern, Middle and Western states. It is rare in Massachusetts and the states north of it, its localities being very circumscribed. After I had taken pains to procure specimens from Connecticut, I accidentally discovered a thicket of the shrubs in a wood in Medford, six miles from Boston.

Late botanists have placed the genus Xanthoxylum in *Pentandria Pentagynia*, although it is diœcious, or rather polygamous. Its *calyx is inferior, five parted; corolla none; capsules from three to five, one seeded.* The *X. fraxineum* is *prickly, the leaves pinnate; leafets ovate, subentire, sessile, equal at base; umbels axillary.*

*Xanthoxylum fraxineum*

Linnæus placed the Xanthoxyla in his natural order *Dumosæ*, but Smith thinks them better arranged with the *Hederaceæ*. Jussieu places them with his *Terebintaceis affinia*.

The branches of the Prickly ash are covered with strong, sharp prickles, arranged without order, though most frequently in pairs at the insertion of the young branches. Leaves pinnate, the common petiole sometimes unarmed and sometimes prickly on the back. Leafets about five with an odd one, nearly sessile, ovate, acute, with slight vesicular serratures, somewhat downy underneath. The flowers appear in April and May before the leaves are expanded. They grow in sessile umbels about the origin of the young branches, are small and greenish. I have observed them of three kinds, making the shrub strictly polygamous. In the staminiferous flower the calyx is five leaved, the leaves oblong, obtuse, erect. Stamens five with subulate filaments and sagittate four celled anthers. In the place of pistils are three or four roundish corpuscles supported on pedicels from a common base. The perfect flowers, growing on the same plant, have the calyx and stamens like the last; the germs are three or four, pedicelled, and having erect, converging styles nearly as long as the

stamens. The pistilliferous flowers grow on a separate shrub. Calyx smaller and more compressed. Germs about five, pedicelled; styles converging into close contact at top, and a little twisted. Stigmas obtuse. All the flowers are destitute of corolla. Each fertile flower produces an umbel of as many stipitate capsules as there were germs in the flower. These capsules are oval, covered with excavated dots, varying from green to red, two valved, one seeded; the seed oval, blackish.

The bark of the Prickly ash has a slight aromatic flavour, combined with a strong pungency, which is rather slow in manifesting itself in the mouth. The leaves are more aromatic, very much resembling, in smell, the leaves of the Lemon tree. The rind of the capsule is highly fragrant, imparting to the fingers, when rubbed between them, an odour much like the oil of lemons. The odorous portion is an essential oil residing in transparent vesicular points on the surface of the capsules and about the margins of the leaves. The acrimony, which resides in the bark, has its foundation in a different principle; being separated by decoction, but not by distillation; at least none of it came over in my experiments, which were repeated with both the

green and dried bark. The water in which the bark is boiled has a peculiar pungent heat, which is not perceived when the liquid is first taken into the mouth, but gradually developes itself by a burning sensation on the tongue and fauces. It retains this acrimony after standing a week and more. The leaves do not appear to possess the pungency of the bark, and impart no acrimony to the water in which they are boiled. They abound in mucilage, which coagulates in large films when alcohol is added to the decoction. They seem to possess more astringency than the bark, and strike a black colour with sulphate of iron, while solutions, made from the bark, are but moderately changed by the same test. The alcoholic tincture of the bark is bitter and very acrid. Its transparency is diminished by adding water, and after standing some time it becomes very turbid. Whether the acrimony of this shrub resides in a peculiar acrid principle, or whether it belongs to the resin and becomes miscible with water in consequence of the presence of mucilage, may be considered as yet uncertain.

The Prickly ash has a good deal of reputation in the United States as a remedy in chronic rheumatism. In that disease its operation seems analogous to that of Mezereon and Guaiacum,

which it nearly resembles in its sensible properties. It is not only a popular remedy in the country, but many physicians place great reliance on its powers in rheumatic complaints, so that apothecaries generally give it a place in their shops. It is most frequently given in decoction, an ounce being boiled in about a quart of water. Dr. George Hayward, of Boston, informs me, that he formerly took this decoction in his own case of chronic rheumatism with evident relief. It was prepared as above stated, and about a pint taken in the course of a day, diluted with water sufficient to render it palatable by lessening the pungency. It was warm and grateful to the stomach, produced no nausea nor effect upon the bowels, and excited little, if any, perspiration.

I have given the powdered bark in doses of ten and twenty grains in rheumatic affections with considerable benefit. A sense of heat was produced at the stomach by taking it, but no other obvious effect. In one case it effectually removed the complaint in a few days. I have known it, however, to fail entirely in obstinate cases, sharing the opprobrium of failure with a variety of other remedies.

The Prickly ash has been employed by physicians in some cases as a topical stimulant.

It produces a powerful effect when applied to secreting surfaces and to ulcerated parts. In the West Indies much use has been made of the bark of another species, the Xanthoxylum *Clava Herculis*, in malignant ulcers, both internally administered and externally applied. Communications relating to its efficacy may be found in the eighth volume of the Medical and Physical Journal, and the fifth volume of the Transactions of the Medical Society of London.

By an ambiguity which frequently grows out of the use of common or English names of plants, the *Aralia spinosa*, a very different shrub, has been confounded with the Xanthoxylum. The Aralia, called *Angelica tree*, and sometimes *Prickly ash*, is exclusively a native of the warmer parts of the United States, being not found, to my knowledge, in the Atlantic states north of Virginia. Its flavour and pungency, as well as its general appearance, are different from those of the true Prickly ash. It is nevertheless a valuable stimulant and diaphoretic, and in Mr. Elliott's Southern Botany, we are told that it is an efficacious emetic. For the latter purpose it is given in large doses, in infusion.

The name Xanthoxylum, signifying *yellow wood*, was originally given by Mr. Colden. The

spelling has since been unaccountably changed to *Zanthoxylon* in a majority of the books which contain the name. The etymology, however, can leave no doubt of the true orthography.

## BOTANICAL REFERENCES.

Xanthoxylum fraxineum, SMITH, *Rees' Cycl. No.* 12.—Z. fraxineum, PURSH, i. 209.—Z. clava Herculis β. LINNÆUS, *Sp. pl.*—Z. ramiflorum, MICHAUX, *Flora*, ii. 235.—Fagara fraxini folio, DUHAMEL, *Arb.* v. *t.* 97.

## MEDICAL REFERENCES.

B. S. BARTON, *Collections*, i. 25, 52; ii. 38.—THACHER, *Dispensatory*, sub Aralia spinosa.

## PLATE LIX.

Fig. 1. *Xanthoxylum fraxineum in fruit.*
Fig. 2. *A barren branch in flower.*
Fig. 3. *Fertile branch in flower.*
Fig. 4. *Barren flower magnified.*
Fig. 5. *Stamen, do.*
Fig. 6. *Abortive germ of the barren flower, do.*
Fig. 7. *Fertile flower, do.*
Fig. 8. *Pistils of ditto, do.*
Fig. 9. *Perfect flower, do.*
Fig. 10. *Capsule, do. beginning to open.*
Fig. 11. *Seed, do.*

*Humulus lupulus*

Arnold & Smith

# HUMULUS LUPULUS.

## *Common Hop.*

=

### *PLATE LX.*

The Hop vine is not only a native of most countries in Europe, but is decidedly indigenous in America. It often occurs wild in the Atlantic states, and was found, by Mr. Nuttall, growing spontaneously on the banks of the Missouri. Sir J. E. Smith has quoted an old distich, which seems to be illustrative of the period of its introduction into practical use in England, about Henry the VIII's time; although he has no doubt of its being really native in that country.* The Hop being a medicinal article of some consequence, and one generally retained by the Pharmacopœias; there is a propriety in introducing it in a Medical Botany of the United States.

* "Turkeys, Carp, Hops, Pickerel and Beer
Came into England all in one year."

The genus *Humulus*, which has only a single species, is found in the Linnæan class *Diœcia*, and order *Pentandria*. It belongs to the natural orders *Scabridæ*, Linn. and *Urticæ*, Juss. Its barren flowers have a *calyx of five leaves and no corolla*. The fertile flowers have for their *calyx the scales of an ament, each two flowered; corolla of one petal, lateral; styles two; seeds solitary, invested with the corolla.*

The Hop vine is an ornamental plant, much more frequently seen cultivated than wild, and climbing to a great height. The root is perennial. Stems annual, twining from right to left, angular, rough, with minute reflexed prickles. Leaves opposite, on long winding petioles, the smaller ones heart-shaped, the larger ones three or five lobed, serrated, veiny and extremely rough. Flowering branches axillary, angular and rough. Stipules two or four, between the petioles, ovate, reflexed. Flowers numerous, and of a greenish colour. Those of the barren plants are very numerous and panicled. Their calyx has five oblong, obtuse, spreading, concave leaves. Corolla wanting. Stamens short, the anthers oblong, and bursting by two terminal pores. The fertile flowers, growing on a separate plant, are in the form of an ament, having each pair of

flowers supported by a calyx-scale, which is ovate, acute, tubular at base. Corolla of one scale, obtuse, smaller than the calyx and placed one on each side of it, infolding the germ by their edge. Germ roundish, compressed; styles two, short; stigmas long, subulate, downy. The scales of the calyx and corolla swell into a kind of persistent cone or strobile, each flower producing a roundish seed.

The full grown strobiles constitute the part which is preserved for use and sold in its dried state under the name of Hops. These have an aromatic, heavy odour, and a strong, bitter, but not unpleasant taste. Besides the bitterness, they have the characteristic taste which is found in the leaves and other portions of the plant. On the outside of the scales of the calyx and corolla and near their base, is secreted a semi-resinous substance in the form of minute, yellow, transparent globules. This secretion appears to be the seat of the whole bitterness for which the hops are generally prized and consumed. Dr. Smith, in the English Botany, has observed, that the fragrance and essential properties of the hop reside in this resinous substance; and more recently an interesting series of experiments has been published by Dr. A. W. Ives, of New York,

to show that this portion may effectually supercede all the rest, in common practical use.

This substance, when separated from the hops by rubbing and sifting, exists in the form of a fine yellow powder. It is adhesive when rubbed between the fingers, and becomes agglutinated by moderate heat. It is very inflammable, and burns entirely out with a white flame, leaving a light cinder.

Dr. Ives has made a variety of experiments with this powder, from which he concludes that it consists of tannin, extractive matter, a bitter principle, wax, resin, and a woody fibrous substance, besides the aromatic principle, which he was unable to separate in the form of volatile oil. It may be observed, that the powder, as employed by him, being obtained from the hops by agitation and sifting, must necessarily contain a certain portion of chaff or minute fragments of the scales; and that these are apparently the seat of the tannin, the woody insoluble substance, and possibly of some other ingredients. If the pure secretion be carefully separated from the scales by brushing, and dissolved in alcohol, it does not undergo any change of colour from the sulphate of iron; although the scales themselves, as well as the

leaves of the plant, strike a black colour when treated with that salt.

Hops have long been made an ingredient in malt liquors on account of the agreeable flavour they communicate, and also from a preservative quality which they are supposed to exert in preventing acescency in those liquids. Dr. Ives has shown that a prodigious saving of expense might be made by brewers, if this powder were separated at an early period, and used instead of the hops themselves. He was able, without much trouble, to separate fourteen ounces of the powder from six pounds of hops, and concludes, that if the hops were treated, during the process of gathering and drying, with a view to the preservation of the powder, they would yield at least one pound in six. He has pointed out a vast saving, which would take place in the expense of transportation and storage, if an article containing all the strength of the hop, and occupying but small compass, were substituted for one which is of more than twenty times its bulk. An enormous loss would farther be prevented, which now takes place from the absorption produced by the hops, it being calculated that one barrel of wort is absorbed by every sixty pounds of hops used in brewing. He enumerates still

farther advantages which would result from the easier preservation of the article, its superior flavour, and the diminished chance of adulteration, arising from reduction of price.*

The researches of Dr. Ives are entitled to great commendation, as they seem to promise a highly economical improvement in an important branch of domestic manufacture. In Great Britain, where malt liquors are more extensively consumed than, perhaps, in any other country, the saving must be an object of more consequence, than with us. It remains to be ascertained whether any effectual and economical method of separating the powder from the strobiles can be brought into practical use.

In medical practice the hop has been found a decided and useful tonic. A fermented decoction, known by the name of hop beer, and usually formed from this article with the simple addition of treacle, is much used in the New England states. When made sufficiently bitter with the hops, and taken as a common drink at meals, it promotes digestion more than any of

* The term *Lupulin*, by which Dr. Ives designates the powder of the hop, is convenient and not objectionable for practical use. As a chemical term, however, it does not agree with those of similar termination employed in the science; which express proximate principles of vegetables &c. and not heterogeneous bodies.

the table liquors in common use. It is serviceable in dyspeptic complaints, and is particularly adapted to obviate the lassitude and debility felt by persons of relaxed habit in the spring, or on the approach of warm weather. A simple infusion has been employed for this purpose, but the fermented liquor derives a quality from the presence of carbonic acid, which renders it more agreeable, both to the palate and stomach.

The bitter principle of the Hop, in which its tonic property appears to reside, is abundantly soluble in water. Alcohol not only extracts this portion, but dissolves also the resinous constituents of the medicine. The tincture of hops is found to be bitter and aromatic, and to exert not only a strengthening effect on the viscera, but to influence considerably the nervous system in the character of an anodyne and soporific medicine.

I have employed the tincture of hops very often in practice, and have, on the whole, had quite as much reason to be satisfied with its tonic operation, as with that of any of the bitter tinctures in common use. Its narcotic power is slight when compared with that of opium, yet it nevertheless has, in certain cases, a decided property of procuring sleep. I have particularly

found it effectual in the case of persons advanced in life, who had been accustomed to the moderate, but increasing use of spirituous liquors; and who at length have considered it impossible to procure a quiet night's sleep without a preparatory draught of this kind taken warm at bed time. In such cases I have found a teaspoonful of the tincture of hops to go as far in its composing effect, as two or three ounces of ardent spirit.

Mr. Freake, who published in the Medical and Physical Journal some account of the properties of this medicine, states that he had found it decidedly advantageous in erysipelas, in gout and in some other diseases. He considers its beneficial effects to arise from its alterative and tonic power on the system. He thinks it sedative, aperient and diuretic; and a good antiseptic and corroborant in bowel complaints. In his practice he had found pain to be eased and rest procured with this medicine, when opium did not succeed.

Dr. Maton found that besides allaying pain and procuring sleep, the preparations of hops were capable of reducing the frequency of the pulse, and increasing its firmness in a direct manner. One drachm of the tincture and four grains of the extract given once in six hours reduced the pulsations from ninety six to sixty in

the course of twenty four hours. He found the extract very efficacious in allaying the pain of of articular rheumatism.

Some experiments of Dr. Bigsby and others have not been found to confirm the previous character of this article in all the foregoing respects, and its sedative powers have been called in question. As in most new medicines, its virtues have doubtless been exaggerated by its earliest advocates; yet it is not on this account to be discarded from use. Although the narcotic powers of the hop are not of the most energetic kind, they nevertheless do exist, and the very circumstance of their mild and temperate influence renders them, in many cases, safer than those of more active drugs.

In regard to the lithontriptic power which has been imputed to hops both alone, and through the medium of malt liquors, it is not probable that they have any operation of this sort, beyond that of a palliative.

The external application of hops has long had the popular reputation of being anodyne and composing. A pillow of hops is thought instrumental in procuring sleep, but with what justice I am unable to say. Poultices and fomentations made of them are in repute as sedative applications for

painful swellings. When steeped in hot brandy and held in the mouth, they sometimes relieve the pain of a carious tooth. For all these purposes, no doubt, they often fail, yet there is little temerity in asserting that they are equally to be depended on in such cases, with the rest of the articles of the Materia Medica.

The most common form for internal use, where a sedative effect is desired, is that of the saturated tincture. The powder separated from the hops may be given in substance with a certainty of securing all their medicinal effects. This powder must be given in small doses, to be retained on the stomach and bowels. Dr. Bryorly found that twenty or twenty five grains left a sense of acrimony in the throat, and were followed by a good deal of nausea, and in some instances by purging.

The vine of the hop has been appropriated to some economical uses. In spring, when the young shoots first emerge from the ground, they are boiled and eaten as asparagus, and are accounted very salubrious. The fibres of the vine are strong and flexible and have been manufactured into a coarse cloth in Sweden and England, particularly for the sacks in which the hops are carried to market.

## BOTANICAL REFERENCES.

**Humulus lupulus, Linn. *Sp. pl.*—Smith, *Engl. Bot. t.* 427.—Miller, *Illustrations, t.* 88.—Michaux, ii.—Pursh, i. 199.—Nuttall, ii. 237.—Lupulus mas et fæmina, Ray, *Syn.* 137.**

## MEDICAL REFERENCES.

**Freake, *Med. and Phys. Journal,* xiii. 432.—Thompson, *London Dispensatory,* 200.—Bigsby, *London Medical Repository,* v. 97.—Bryorly, *Inaug, Diss. Philad.* 1803.—Ives, *in Silliman's Journal,* ii. 302.**

## PLATE LX.

**Fig. 1. *Humulus lupulus in fruit.***

**Fig. 2. *Fertile flowers.***

**Fig. 3. *Calyx and pistil of do. (the corolla omitted by mistake of the engraver.)***

**Fig. 4. *Barren flowers.***

**Fig. 5. *Stamen magnified.***

# NOTES.

## *Note A.*

Ranunculi, quod aliqui apium agreste nominant, plura quidem sunt genera: at vis tamen omnibus una, acris scilicet ac vehementer exulcerans. Ac unum quidem coriandri foliis constat, sed latioribus, subalbidis et pinguibus: flore luteo, interdùm purpureo. Caulis minimé crassus est, sed cubitum altus. Radice nititur exigua, candida et amara, adnatis ceu capillamentis, hellebori modo, fibrata: juxta fluenta nascitur. Alterum est lanuginosius, longioréque caule, pluribus foliorum incisuris, plurimum in Saridinia proveniens, acerrimum, quod etiam sylvestre apium appellant. Est et tertium valde parvum et odore gravi; flore aureo. Quartum simile huic, flore lacteo. Folia et caules tenelli vim habent illitu exulcerandi, et usque adeò urendi, ut etiam crustas cum dolore inducant. Quare scabros ungues auferunt, psoras removent, stigmata delent: itemque formicationes ac pensiles verrucas et alopecias ad breve tempus imposita tollunt. Quin et repente eorum decocto perniones foventur. Radix verò sicca tritáque, sternutamenta ciet, naribus admota: dentium quoque dolores appensa levat, ipsos tamen rumpit.

*Dioscorides. Interp. Sarraceni*, Lib. ii. Cap. 206.

## *Note B.*

Sponte jam patet, internum Euphorbii usum periculo plenum esse. Sed confirmant id infortunia, specialibus casibus subnata. Obiit quidam, cui empiricus illud imprudenter exhibuerat, dysenteria eodem die. Virgo venusta seni decrepito, se invita, desponsata ad mortem sibi conciliandam pulverem Euphorbii ingessit, unde dolores ventris atrocissimi, hypercatharses cum vomitionibus frequentissi-

mis, singultu, ardore ventriculi et faucium sitique inextinguibili, tandem sudores frigidi et animi deliqeia: ex quibus angustiis tamen arte emersit. Nihilomimus tamen quidam illud præcipere ausi sunt, et instar drastici, quod pituitam, sed potentius aquam, subduceret in iis, quibus venter nimis contra alia mitiora torpet, vel ut loqui amant, friget, in hydropicis præcipue admiserunt. Ita Ætius, Actuarius et Arabes non nulli. Galenus et Dioscorides tacent de vi ejus purgante. Omnes tamen, qui ore captum concedunt, cautionem summam injungunt, et connubium, cum iis, quæ acrimonium ejus frangere valent, vel prægressam mitigationem desiderant. Hanc ipsam tentarunt oleo amygdalino, succo Citri, phlegmate Vitrioli, Mastiche, Croco, Tragacantha, Melle aliisque bene multis secundum varium de ejus natura conceptum. Sed ejusmodi correctiones vel non sufficiunt, vel, si sufficiunt, ipsam vim medicaminis destruunt. Minuere dosin vel rite illam diluere, aliis exemplis artis est. Ast nondum comprobata vera dosis est. Ad grana decem permittit Sennertus, alias non ineptus subdolæ Euphorbii vis judex; a grano uno ad octo cum semisse concedit Heurnius; a granis duobus sex vel octo Geoffroy. Omnibus hisce audacior et Fallopius, qui præceptoris sui Machesii auctoritate et propria experientia ductus, non dubitavit Euphorbii vetusti drachmam unam, rarius scrupulos quatuor, dare. Mixtum Cassia mitius deprehendit quam solutum, qua forma sitim intolerabilem et evacuationem largiorem creavit. Sed praestat usum internum eiusdem omnino negligere.

*Murray Apperatus Medicaminum sub Euphorbia officinarum.*

## *Note C.*

Nymphæa in paludibus stagnantibúsque aquis nascitur: folia veró habet Ægyptiæ fabæ similia, at minora oblongioráque, plura ab una eadémque radice prodeuntia: quorum alia super aquam quodammodo extant, alia in ea ipsa demerguntur: florem album, lilio similem, in quo medium croceúm est. At cúm defloruerit, calyculus rotundus, figura malo aut papaveris capiti similis, idemque niger, extuberat: in quo semen nigrum, latum, densum, atque gustanti lentum glutinosumve recluditur. Caulis est lævis, minimé crassus,

niger, Ægyptiæ fabæ cauli similis: radix nigra, scabra, clavæ similis, quæ autumno secatur. Ea sicca, cum vino pota, cœliacis ac dysentericis auxiliatur, lienemque consumit. Stomachi quoque ac vesicæ doloribus sedandis ipsa radix imponitur, et alphos ex aqua emendat: alopeciis etiamnum cum pice imposita medetur. Eadèm contra veneris insomnia bibitur, siquidem illa in totúm adimit: quin et aliquot diebus continenter epota, genitale ita infirmat, ut arrigi minimé possit. Idem porro seminis quoque poti effectus est. Cæterùm à nymphis nymphææ nomen sibi vendicasse creditur, quoniam loca amet aquosa. Plurima autem inuenitur in Helide, Anygro amne, et in Bœotiæ Aliarto.

*Dioscorides interp. Sarraceni*, iii 148.

# APPENDIX.

## PHYTOLACCA DECANDRA.

It has been already stated that the inconveniences in the emetic operation of this plant are its slow commencement, long continuance, and occasional narcotic effect. I have, since writing the article, become acquainted with instances of hypercatharsis, following the employment of this medicine in large doses. A physician informed me that having himself occasion for an emetic, he took twenty grains of Pulv. Phytolaccæ, which not operating readily he took twenty more within an hour. This large quantity brought on severe vomiting, which continued until his strength was exhausted. A hypercatharsis followed attended with inflammation of the bowels from which he was a week in recovering. In a few other instances I have known a decided effect take place on the retina, producing blindness for two or three

hours. In general, it may be considered improper to give large quantities of this medicine, or to accumulate it by the repetition of small quantities. In these respects it has not the safety of the officinal Ipecacuanha. See some remarks on this subject under the article Euphorbia ipecacuanha, *Vol.* iii. p. 117.

## ARUM TRIPHYLLUM.

The root of this plant has sometimes been taken internally as it would seem without injury. The late Dr. Osborne, of New York, informed me that he had given it in the form of confection, or in emulsion with milk and sugar, in cases of great prostration attending the advanced stages of typhoid fevers. He thought it useful as part of a cordial regimen, and had found that patients bore it as well as cayenne pepper or any similar stimulant. In the American Medical Recorder, for July 1820, Dr. Burgon, of Pennsylvania, has inserted some account of its beneficial operation in asthma, chronic, catarrh, and similar complaints. It is undoubtedly a stimulant of the most powerful kind, and when fresh should be taken with great caution. In its dried state it is uncertain in its strength, and sometimes wholly inert.

## TRIOSTEUM PERFOLIATUM.

THAT the Aborigines made use of this plant in medicine is attested in Mr. Clayton's letter to Dr. Grew in the Philosophical transactions, Vol. VIII. of Hutton's abridgment. He says, "There is another herb which they call Indian purge. This plant has several woody stalks growing near three feet tall, and perfoliate; it bears yellow berries round about the joints. They only make use of the root of this plant." From this description it is sufficiently obvious that the plant in question was no other than Triosteum perfoliatum.

## CICUTA MACULATA.

THE following is part of a letter from Dr. Richard Hazeltine of Lynn, Mass. dated May 9, 1818, which was accompanied by a root o Cicuta maculata, but received after I had printed the article on that plant.

"On Friday, the 17th of last month, between two and three o'clock P. M. I was called to see a boy aged four years, in the last struggles of

expiring life, from having eaten and swallowed some of a root, of which I send you a sample.

"The history of the circumstances of the case, as accurately as I could obtain them, was as follows:—Between nine and ten o'clock A. M. of that day, two or three of the children of the family were observed to be eating certain roots which they had found in a ploughed field near the house, and which they supposed to be ground nuts, artichokes, or something that was innoxious. The boy first complained that he had pain in his bowels, and felt as if he had a call to a dejection, and was directed to go to stool; but very soon returned and said he could do nothing. In a few seconds he puked, and brought up, as an intelligent woman, who was present, told me, a teacup full of what she believes to be the recently masticated root. Upon questioning her particularly upon the point, she told me that the first impression made upon her mind after seeing the boy puke was, that the vomiting was occasioned by the root that he had eaten. Immediately after puking, he fell back in convulsions, which, with various remissions and exacerbations, continued till he died. A physician was directly called, who, believing the convulsions to be owing to the poisonous quality of the root which he had

eaten, endeavoured to excite vomiting, by administering what I supposed to be a solution of tartrite of antimony in water. I was told that the physician took his leave about one o'clock, having been unable to excite vomiting, and expressing an opinion, that the boy would continue but a few moments. I found the boy in a profuse sweat, and in constant convulsions. The convulsive agitations consisted of *tremors; violent contractions and distortions, with alternate and imperfect relaxations of the whole muscular system; astonishing mobility of the eyeballs and eyelashes, with widely dilated pupils; stridor dentium; trismus; frothing at the mouth and nose, mixed with blood;* and occasionally, *violent and genuine epilepsy;* of which he had two paroxysms after I arrived, which was only about half an hour before he expired. The convulsive agitations were so powerful and incessant, that I could not examine his pulse with sufficient constancy to ascertain its character. Very soon after dissolution, and sometime before the natural warmth had become extinct, the limbs became remarkably rigid. With a view to empty the stomach, I attempted to get down Pulv. Ipecac in warm water, in which, although I succeeded tolerably well, yet I could not possibly excite vomiting,

even with the addition of frequent and active titillation of the internal fauces with a goose quill.

"The next day (Saturday) at 4 o'clock, P. M. rather more than twenty four hours after dissolution, I examined the body. The extremities were more flexile than usual after death. Upon turning the body on the left side, a quantity of greenish coloured fluid issued from the mouth. The viscera of the thorax and abdomen being exposed, nothing remarkable appeared, except a greater degree than common of distention from flatus. The stomach was distended to the capacity of at least three pints, from flatus, and about three gills of a muciform, greenish fluid, such as had flowed from the mouth; on the surface of which was plainly distinguished some of the masticated root. On this point the persons present spoke with confidence. There were no appearances of inflammation. I endeavoured to ascertain whether there were worms, but could find none. The liquid found in the stomach after exposure to the air for half an hour in a vessel, assumed a dark green.

"Highly interested to know what the root was which had caused the boy's death; immediately after he died I went to the ploughed ground

whence he procured it, and soon found one of the same kind, entire, and of the size of a middling potatoe. It is, I believe, what botanists call a 'tuberous root.' I broke off one of the knobs or buds, by which it was unequivocally ascertained to be of the same kind of that of which he ate a portion, and of which a piece was preserved. I planted the root which I found in my garden; and perceive that its sprouts already begin to appear above ground; so that I flatter myself the ensuing seasons will develop its botanical character. The specimen which I send you, is a knob broken off from the main body of the root which I planted in my garden; and will, perhaps, at once, be recognised by you. If it should not, I hope ere long to exhibit the vegetable in its perfect state, and thereby obtain from your kindness its botanical name and character."

## KALMIA LATIFOLIA.

I BELIEVE that no narcotic effect ensues from this shrub in any case where a moderate quantity is taken. Dr. Osgood of Danvers informs me, that having chewed and swallowed five or six large leaves at once, he was affected with head-

ach and vomiting in consequence. Whether this effect was owing to a peculiar quality of the leaves, or merely to the large amount of a crude, resinous substance taken into the stomach at once, admits of some doubt. At any rate, if the plant be of a deleterious nature, the quantity requisite to produce ill consequences is greater than any person will probably be in much danger of taking at a time.

## PODOPHYLLUM PELTATUM.

Dr. Burgon, in the Medical Recorder, gives the following account of the medical operation of this plant. "The powdered root," says he, "is extensively employed as a cathartic in bilious complaints, and I am persuaded with as much success as jalap. I have often prescribed it, combined with calomel in the proportion of twenty grains of the former to eight or ten of the latter, and have uniformly been pleased with its effects on my patients. In this dose it is extremely prompt and efficacious. My experience enables me to state, that it is more drastic than jalap, and of course occasions more active catharsis, more severe griping, and makes a

more permanent impression on the system. Its operation, in all cases in which I have administered it, is slower than that of jalap, but it leaves the bowels longer in a lax and soluble condition. I once took twenty grains at four o'clock P. M. which gave me no disturbance till next morning, when its operation commenced and produced continual motions all that day and part of the next night together with severe tornina; this was the first dose of Podophyllum I had ever administered; and its effects being so decided, I have since prescribed it in a multitude of cases, and for the most part with similar results. Like most other drastic cathartics it is rendered milder by combining it with calomel, and hence, in most cases, this combination is to be preferred to giving it alone. It is more disagreeable to the stomach than common purgatives, and will oftener occasion emesis. In bilious affections it usually supercedes the necessity of an emetic previous to a cathartic, and hence two desirable effects are produced by one agent.

I was employed one afternoon in a close room in powdering the Rad. podophylli, which, by the next morning, occasioned a most violent inflammation of my right eye and eyelid; it yielded, however, to the antiphlogistic regimen in eight or ten days.

# SYSTEMATIC INDEX

BY THE

## LINNÆAN METHOD.

### TRIANDRIA.

Iris versicolor.

### TETRANDRIA.

Cornus florida. Ictodes fœtidus.

### PENTANDRIA.

Datura stramonium.
Hyoscyamus niger.
Nicotiana tabacum.
Solanum dulcamara.
Menyanthes trifoliata.
Sabbatia angularis.
Spigelia Marilandica.
Triosteum perfoliatum.
Lobelia inflata.
Conium maculatum.
Cicuta maculata.
Gentiana Catesbæi.
Asclepias tuberosa.
Apocynum androsæmifolium.
Rhus vernix.
Rhus radicans.
Panax quinquefolium.
Statice Caroliniana.

### HEXANDRIA.

Aletris farinosa.
Erythronium Americanum.
Prinos verticillatus.

### OCTANDRIA.

Dirca palustris.

### ENNEANDRIA.

Laurus sassafras.

### DECANDRIA.

Kalmia latifolia.
Rhododendron maximum.
Arbutus Uva ursi.
Gaultheria procumbens.
Pyrola umbellata.
Cassia Marilandica.
Phytolacca decandra.

## DODECANDRIA.

Asarum Canadense.

## ICOSANDRIA.

Gillenia trifoliata.
Rubus villosus.

## POLYANDRIA.

Sanguinaria Canadensis.
Liriodendron tulipifera.
Podophyllum peltatum.
Magnolia glauca.
Nymphæa odorata.
Illicium floridanum.
Coptis trifolia.
Ranunculus bulbosus.

## MONADELPHIA.

Geranium maculatum.

## DIADELPHIA.

Polygala senega.
Polygala rubella.

## SYNGYNESIA.

Eupatorium perfoliatum.
Solidago odora.

## GYNANDRIA.

Aristolochia serpentaria.

## MONŒCIA.

Arum triphyllum,
Juglans cinerea.

## DIŒCIA.

Xanthoxylum fraxineum.
Myrica cerifera.
Humulus lupulus.
Juniperus communis.
Euphorbia ipecacuanha.
Juniperus Virginiana.
Euphorbia corollata.

## POLYGAMIA.

Veratrum viride.

# LATIN INDEX.


| | Plate. | Vol. | Page. |
|---|---|---|---|
| Aletris farinosa, | L. | III. | 92 |
| Apocynum androsæmifolium, | XXXVI. | II. | 143 |
| Arbutus Uva ursi, | VI. | I. | 66 |
| Aristolochia serpentaria, | XLIX. | III. | 821 |
| Arum triphyllum, | IV. | I. | 52 |
| Asarum Canadense, | XV. | I. | 149 |
| Asclepias tuberosa, | XXVI. | II. | 59 |
| Cassia Marilandica, | XXXIX. | II. | 166 |
| Chimaphila corymbosa. Vide Pyrola umbellata. | | | |
| Chironia angularis. Vide Sabbatia angularis. | | | |
| Cicuta maculata, | XII. | I. | 125 |
| Conium maculatum, | XI. | I. | 113 |
| Coptis trifolia, | V. | I. | 60 |
| Cornus florida, | XXVIII. | II. | 73 |
| Datura stramonium, | I. | I. | 17 |
| Dirca palustris, | XXXVII. | II. | 154 |
| Dracontium fœtidum. Vide Ictodes fœtidus. | | | |
| Erythronium Americanum, | LVIII. | III. | 151 |
| Eupatorium perfoliatum, | II. | I. | 33 |
| Euphorbia corollata, | LIII. | III. | 119 |
| Euphorbia ipecacuanha, | LII. | III. | 107 |
| Gaultheria procumbens, | XXII. | II. | 27 |
| Gentiana Catesbæi, | XXXIV. | II. | 137 |
| Geranium maculatum, | VIII. | I. | 84 |
| Gillenia trifoliata, | XLI. | III. | 11 |
| Helleborus trifolius. Vide Coptis trifolia. | | | |

| | | | |
|---|---|---|---|
| Helonias viridis. Vide Veratrum viride. | | | |
| Humulus lupulus, | LX. | III. | 163 |
| Hyoscyamus niger, | XVII. | I. | 161 |
| Ictodes fœtidus, | XXIV. | II. | 41 |
| Illicium Floridanum, | XLVIII. | III. | 76 |
| Iris versicolor, | XVI. | I. | 155 |
| Juglans cinerea, | XXXII. | II. | 115 |
| Juniperus communis, | XLIV. | III. | 43 |
| Juniperus Virginiana, | XLV. | III. | 49 |
| Kalmia latifolia, | XIII. | I. | 133 |
| Laurus sassafras, | XXXV. | II. | 142 |
| Liriodendron tulipifera, | XXXI. | II. | 107 |
| Lobelia inflata, | XIX. | I. | 178 |
| Magnolia glauca, | XXVII. | II. | 67 |
| Menyanthes trifoliata, | XLVI. | III. | 55 |
| Myrica cerifera, | XLIII. | III. | 32 |
| Nicotiana tabacum, | XL. | II. | 171 |
| Nymphæa odorata, | LV. | III. | 134 |
| Panax quinquefolium, | XXIX. | II. | 82 |
| Phytolacca decandra, | III. | I. | 39 |
| Podophyllum peltatum, | XXIII. | II. | 34 |
| Polygala rubella, | LIV. | III. | 129 |
| Polygala senega, | XXX. | II. | 97 |
| Prinos verticillatus, | LVI. | III. | 141 |
| Pyrola umbellata, | XXI. | II. | 15 |
| Ranunculus bulbosus, | XLVII. | III. | 61 |
| Rhododendron maximum, | LI. | III. | 101 |
| Rhus radicans, | XLII. | III. | 19 |
| Rhus vernix, | X. | I. | 96 |
| Rubus villosus, | XXXVIII. | II. | 160 |
| Sabbatia angularis, | LVII. | III. | 147 |
| Sanguinaria Canadensis, | VII. | I. | 75 |
| Solanum dulcamara, | XVIII. | I. | 169 |
| Solidago odora, | XX. | I. | 187 |
| Spigelia Marilandica, | XIV. | I. | 142 |

Spiræa trifoliata. Vide Gillenia trifoliata.
Symplocarpus fœtidus. Vide Ictodes fœtidus.
Triosteum perfoliatum, IX. I. 90
Veratrum viride, XXXIII. II. 121
Xanthoxylum fraxineum, LIX. III. 156
Zanthoxylum fraxinifolium. Vide Xanthoxylum fraxineum.

# ENGLISH INDEX.


| | Plate. | Vol. | Page. |
|---|---|---|---|
| American Centaury, | LVII. | III. | 147 |
| American Hellebore, | XXXIII. | II. | 121 |
| American Hemlock, | XII. | I. | 125 |
| American Rosebay, | LI. | III. | 101 |
| American Senna, | XXXIX. | II. | 162 |
| Apple Peru. See Thorn Apple. | | | |
| Bayberry. See Wax Myrtle. | | | |
| Bearberry, | VI. | I. | 66 |
| Bitter Polygala, | LIV. | III. | 129 |
| Bitter sweet, | XVIII. | I. | 169 |
| Black Alder, | LVI. | III. | 141 |
| Blazing Star. See Star Grass. | | | |
| Blood root, | VII. | I. | 75 |
| Blue flag, | XVI. | I. | 155 |
| Blue Gentian, | XXXIV. | II. | 137 |
| Bone set. See Thorough wort. | | | |
| Buck Bean, | XLVI. | III. | 55 |
| Bulbous Crowfoot, | XLVII. | III. | 61 |
| Buttercup. See Bulbous Crowfoot. | | | |
| Butterfly weed, | XXVI. | II. | 59 |
| Butternut, | XXXII. | II. | 115 |
| Callico bush. See Mountain Laurel. | | | |
| Canada Snake root. See Wild Ginger. | | | |
| Candle berry. See Wax Myrtle. | | | |
| Carolina Pink root, | XIV. | I. | 142 |
| Chequer berry. See Partridge berry. | | | |

| | | | |
|---|---|---|---|
| Cocum. See Poke. | | | |
| Common Erythronium, | LVIII | III. | 151 |
| Common Gillenia, | XLI. | III. | 11 |
| Common Juniper, | XLIV. | III. | 43 |
| Crane's bill, | VIII. | I. | 84 |
| Dog's bane, | XXXVI. | II. | 148 |
| Dog wood, | XXVIII. | II. | 73 |
| Dragon root, | IV. | I. | 52 |
| Fever root, | IX. | I. | 90 |
| Garget. See Poke. | | | |
| Ginseng, | XXIX. | II. | 82 |
| Golden rod, | XX. | I. | 187 |
| Gold Thread, | V. | I. | 60 |
| Hemlock, | XI. | I. | 113 |
| Henbane, | XVII. | I. | 161 |
| Hop, | LX. | III. | 163 |
| Indian Physic. See Common Gillenia. | | | |
| Indian Tobacco, | XIX. | I. | 178 |
| Indian Turnip. See Dragon root. | | | |
| Ipecacuanha spurge, | LII. | III. | 107 |
| Ivy. See Poison Ivy. | | | |
| Jamestown weed. See Thorn Apple. | | | |
| Lamb kill. See Mountain Laurel. | | | |
| Large flowering spurge, | LIII. | III. | 119 |
| Leatherwood, | XXXVII. | II. | 154 |
| Marsh Rosemary, | V. | II. | 51 |
| Marsh trefoil. See Buck Bean, | | | |
| May Apple, | XXIII. | II. | 34 |
| Mountain Laurel, | XIII. | I. | 133 |
| Night shade. See Bitter sweet. | | | |
| Oilnut. See Butternut. | | | |
| Partridge berry, | XX II. | II. | 27 |
| Pink root. See Carolina Pink root. | | | |
| Pipsissewa. See Winter green. | | | |
| Pleurisy root. See Butterfly weed. | | | |

| | | | |
|---|---|---|---|
| Poison Dogwood. See Poison Sumach. | | | |
| Poison Ivy, | XLII. | III. | 19 |
| Poison Sumach, | X. | I. | 96 |
| Poke, | III. | I. | 39 |
| Poke root. See American Hellebore. | | | |
| Poplar. See Tulip tree. | | | |
| Prickly ash, | LIX | III. | 156 |
| Red Cedar, | XLV. | III. | 49 |
| Red root. See Blood root, | | | |
| Sassafras, | XXXV. | II. | 142 |
| Savin. See Red Cedar. | | | |
| Seneca Snake root, | X. | II. | 97 |
| Sheep poison. See Mountain Laurel. | | | |
| Skunk Cabbage, | IV. | II. | 41 |
| Swamp Sumach. See Poison Sumach. | | | |
| Small Magnolia, | χXVII. | II. | 67 |
| Snake weed. See American Hemlock. | | | |
| Spoon wood. See Mountain Laurel. | | | |
| Star Grass, | L. | III. | 92 |
| Starry Anise, | XLIII. | III. | 76 |
| Tall Blackberry, | XXXVIII. | II. | 160 |
| Thorn Apple, | I. | I. | 17 |
| Thoroughwort, | II. | I. | 33 |
| Tobacco, | XL. | II. | 171 |
| Tulip Tree, | XXXI. | II. | 107 |
| Virginia Snake root, | XLIX. | III. | 82 |
| Water Lily, | LV. | III. | 134 |
| Wax Myrtle, | XLIII. | III. | 32 |
| Wild Ginger, | XV. | I. | 149 |
| Wild Lemon. See May Apple. | | | |
| Winter Green, | χχI. | II. | 15 |

# CONTENTS OF THE THIRD VOLUME.


| | | |
|---|---|---|
| *Gillenia trifoliata,* | Common Gillenia, | page 11 |
| *Rhus Radicans,* | Poison Ivy, | 19 |
| *Myrica cerifera,* | Wax Myrtle, | 32 |
| *Juniperus communis,* | Common Juniper, | 43 |
| *Juniperus Virginiana,* | Red Cedar, | 49 |
| *Menyanthes trifoliata,* | Buck Bean, | 55 |
| *Ranunculus bulbosus,* | Bulbous Crowfoot, | 61 |
| *Illicium floridanum,* | Starry Anise, | 76 |
| *Aristolochia serpentaria,* | Virginia Snakeroot, | 82 |
| *Aletris farinosa,* | Star Grass, | 92 |
| *Rhododendron maximum,* | American Rosebay, | 101 |
| *Euphorbia Ipecacuanha,* | Ipecacuanha Spurge, | 107 |
| *Euphorbia corollata,* | Large flowering Spurge, | 119 |
| *Polygala rubella,* | Bitter Polygala, | 129 |
| *Nymphæa odorata,* | Sweet scented Water Lily, | 134 |
| *Prinos verticillatus,* | Black Alder, | 141 |
| *Sabbatia angularis,* | American Centaury, | 147 |
| *Erythronium Americanum,* | Common Erythronium, | 151 |
| *Xanthoxylum fraxineum,* | Prickly Ash, | 156 |
| *Humulus lupulus,* | Common Hop, | 163 |
| *Notes,* | | 175 |
| *Appendix,* | | 179 |